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PUBLIC HEALTH.

TWENTY-FIRST ANNUAL REPORT
OF
THE LOCAL GOVERNMENT BOARD,
1891—92.

S U P P L E M E N T

IN CONTINUATION OF THE
REPORT OF THE MEDICAL OFFICER
For 1891.

ENTERIC FEVER IN THE TEES VALLEY.

Presented to both Houses of Parliament by Command of Her Majesty.



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R E P O R T

ON

ENTERIC FEVER IN THE TEES VALLEY

D U R I N G 1890—91.

B Y D R. B A R R Y.

WITH

*AN INTRODUCTION BY THE MEDICAL OFFICER OF
THE LOCAL GOVERNMENT BOARD.*

CONTENTS.

	Page.
INTRODUCTION BY THE MEDICAL OFFICER, DR. R. THORNE THORNE - - - - -	v
DR. BARRY'S REPORT ON THE EPIDEMIC PREVALENCE OF ENTERIC FEVER DURING 1890-91 IN CERTAIN SANITARY DISTRICTS SITUATE IN THE VALLEY OF THE RIVER TEES IN SOUTH DURHAM AND NORTH YORKSHIRE - - - - -	3
Introduction - - - - -	3
I. <i>Incidence of Enteric Fever on Registration Districts</i> - - - - -	3
Enteric Fever attacks during 32 fortnights ended 21st March 1891 - - - - -	3
Enteric Fever mortality during 26 fortnights ended 27th June 1891 - - - - -	6
II. <i>Incidence of Enteric Fever on Sanitary Districts</i> - - - - -	8
Area, population, and inhabited houses in the 32 Sanitary Districts comprised within the area of Inquiry - - - - -	8
Enteric Fever attacks during 32 fortnights ended 21st March, 1891 - - - - -	9
Enteric Fever mortality during 26 fortnights ended 27th June, 1891 - - - - -	13
Summary of facts with respect to Enteric Fever attacks and deaths in Sanitary Districts - - - - -	16
Distribution of Enteric Fever attacks in 1890-91 among the several wards of the Boroughs of Darlington, Stockton-on-Tees, and Middlesbrough respectively - - - - -	16
Distribution of Enteric Fever attacks in 1890-91 in the Rural Sanitary Districts of Darlington and Stockton - - - - -	20
Elimination of milk as a possible channel of infection in Epidemic of 1890-91 - - - - -	21
III. <i>Sanitary circumstances of the ten Sanitary Districts suffering from exceptional incidence of Enteric Fever in 1890-91</i> - - - - -	21
(1.) General description, including topography, industries, dwelling accommodation, streets, &c. - - - - -	21-32
(2.) Excrement and refuse disposal - - - - -	32-36
(3.) Sewerage and drainage - - - - -	36-40
(4.) Water supply - - - - -	40-41
IV. <i>Incidence of Enteric Fever on Districts (or parts of Districts) supplied with water from the River Tees, and on Districts (or parts of Districts) supplied from other sources</i> - - - - -	41
Number of houses and estimated population in each of the 32 Sanitary Districts comprised within the area of inquiry supplied with water from the Tees and from other sources respectively - - - - -	41
Enteric Fever attacks amongst users and non-users of Tees water respectively during 32 fortnights ended March 21st, 1891 - - - - -	42
Enteric Fever mortality amongst users and non-users of Tees water respectively during 26 fortnights ended June 27th, 1891 - - - - -	46
Summary of facts as regards Enteric Fever attacks and mortality amongst users and non-users of Tees water respectively - - - - -	49
V. <i>Special circumstances of the Water Supply of the Districts invaded by Enteric Fever in the Tees Valley</i> - - - - -	50
Description of the Waterworks of the Darlington Corporation - - - - -	50
Description of the Waterworks of the Stockton and Middlesbrough Water Board - - - - -	51
Condition of the River Tees above the intakes of the Waterworks - - - - -	53
Rainfall in the Tees Valley in 1890 - - - - -	56
Floods in the River Tees in 1890 - - - - -	57
Sources of specific infection of River Tees during 1890 - - - - -	58
History of the Stockton and Middlesbrough Water Supply - - - - -	58
Special investigations as to fouling of River Tees made by order of Darlington Corporation - - - - -	60
Conclusion - - - - -	61
<i>Appendices to Dr. Barry's Report—</i>	
A.—Return of houses supplied with water from the works of the Stockton and Middlesbrough Water Board - - - - -	63
B.—List of cases of Enteric Fever notified from day to day during the period 24th August 1890—21st March 1891, in each Sanitary District within the area of the Tees Inquiry, together with the source of water supply used in each instance - - - - -	64
C.—Return showing the amount of water pumped from the River Tees day by day during the six months ended 31st December 1890 at the Waterworks of the--	
(1.) Darlington Corporation - - - - -	107
(2.) Stockton and Middlesbrough Water Board - - - - -	108
D.—Topographical description of the River Tees from its source to the sea, by Professor Austed	111

	Page.
E.—Meteorological and Rainfall Returns :—	
(1.) Register of rainfall kept at Mickleton in 1890 - - - -	113
(2.) Do. do. Barnard Castle in 1890 - - - -	113
(3.) Do. do. Whorlton in 1890 - - - -	114
(4.) Do. do. Raby Castle, Staindrop, in 1890 - - - -	114
(5.) Do. do. Southend, Darlington, in 1890 - - - -	115
(6.) Do. do. Albert Park, Middlesbrough, in 1890 - - - -	115
(7.) Meteorological Register kept at the Albert Park, Middlesbrough, for the four months ending October 31st, 1890 - - - -	116
F.—Abstract of observations made by the Water Bailiffs of the Tees Salmon Fishery Board as to Floods in the Tees during 1890 :—	
(1.) Observations made by Inspector Mabon at Blackwell - - - -	118
(2.) Observations made by Inspector Brunskill at Middleton One Row - - - -	118
G.—Reports on Chemical Analyses of Tees Water made in 1890–91 :—	
(1.) Report by Mr. W. F. K. Stock on chemical analyses of (a) water taken from the River Tees at the intake of the Darlington Waterworks, and (b) of water from a tap in the town after having passed through the waterworks, in November 1890 - - - -	119
(2.) Report by Mr. W. F. K. Stock on similar samples taken in January 1891 - - - -	120
(3.) Report by Dr. Frankland on the chemical analysis of a sample of water collected in Middlesbrough in August 1890 - - - -	121
(4.) Do. do. sample collected October 1890 - - - -	122
(5.) Do. do. sample collected December 1890 - - - -	122
(6.) Report by Mr. Allen do. do. October 1890 - - - -	123
(7.) Report by Messrs. Pattinson and Stead do. do. - - - -	123
(8.) Report by Mr. A. C. Wilson on the chemical and bacteriological examination of a sample of water collected at Stockton-on-Tees in August 1891 - - - -	124
H.—Reports made to the Corporation of Darlington in 1887 with reference to the pollution of the River Tees :—	
(1.) Report by Mr. Councillor Drury - - - -	125
(2.) Report by Mr. Councillor Manson - - - -	126
(3.) Extracts from a Report made by Dr. Hare on a bacteriological examination of the Tees water - - - -	127
(4.) Report by Mr. W. F. K. Stock on the chemical examination of the Tees water - - - -	133
(5.) Report by the late Professor Tidy - - - -	136
ADDENDUM: NOTES BY DR. BARRY UPON THE FATAL INCIDENCE OF ENTERIC FEVER IN 18 REGISTRATION DISTRICTS (COMPRISING 69 SANITARY DISTRICTS) OF NORTHUMBERLAND, DURHAM, AND NORTH YORKSHIRE, REPORTED BY THE REGISTRAR GENERAL TO HAVE SUFFERED COLLECTIVELY IN 1890 IN AN EXCEPTIONAL DEGREE FROM THAT DISEASE - - - -	
	137–150

INTRODUCTION

BY THE

MEDICAL OFFICER.

TO THE RIGHT HONOURABLE THE PRESIDENT OF THE LOCAL GOVERNMENT BOARD.

SIR,

In presenting his Annual Report on the proceedings of the Medical Department during the year 1890, my predecessor, Sir George Buchanan, submitted, in the following words, an Interim Report by Dr. Barry on an epidemic prevalence of Enteric Fever in the Valley of the Tees :—

“I would . . . direct special attention to Dr. Barry’s Interim Report on an epidemic prevalence of Enteric Fever in the Valley of the Tees, reserving his complete report until he shall be able to use the facts of the new Census. Dr. Barry gives an account of an outburst of Enteric Fever in the Tees Valley occurring immediately after a heavy flood of the river, and selecting simultaneously those districts which procured their drinking water from a certain section of the Tees. The circumstantial evidence of a relation between the fever and the water supplies was such as might have sufficed to implicate the one as a cause of the other. But furthermore we are told that no other common condition belonging to the several districts could be discovered, bar that of water supplies from the same part of the Tees; and presently we learn that the river, before it reaches this place, habitually receives in abundance the excrements of people higher up the stream. This fact was perfectly well known in the districts which derive their drinking water from this part of the river. It was well for Stockton, Middlesbrough, and Darlington that the specific poison contained in the excrements befouling the Tees in 1890 was not that of Asiatic Cholera.”

The interest attaching to the circumstances of this epidemic was, however, materially enhanced by reason of the fact that whilst the interim Report was passing through the press a second outburst of Enteric Fever occurred in the Valley of the Tees, its incidence being, as was the case during the first epidemic prevalence, special to localities deriving their water supply from the River Tees. The excess of Enteric Fever attacks occasioning the first outburst was most marked during a six-weeks’ period, 7th September—18th October 1890; that occasioning the second outburst during a six-weeks’ period, 28th December 1890.—7th February 1891. Both outbursts are dealt with by Dr. Barry in the annexed report; the statistical evidence bearing upon each being based on the detailed results of the Census of 1891.

Dr. Barry’s Report has concern primarily with 10 Registration Districts lying immediately to the north and to the south of the River Tees, and having together a population of 503,616 (1891); these 10 districts forming part of a large area in Northumberland, Durham, and Yorkshire, in most of which, according to the Registrar-General, Enteric Fever has been unduly prevalent during recent years. By the aid of returns made under the Infectious Disease (Notification) Act, 1889, supplemented by special returns from Medical Officers of Health and from Medical Practitioners, where the provisions of that Act were not in operation, it transpired that 1,463 cases of Enteric Fever occurred in these 10 Registration Districts in the two six-weeks’ periods referred to; and that of these 1,463 cases, 1,334, or 91 per cent. occurred in three Registration Districts, namely those of Darlington, Stockton, and Middlesbrough. Indeed the rates of attack from Enteric Fever per 10,000 of the population, in the first and the second of the two six-weeks’ periods, were 29 and 24 respectively on the population of 251,976 living in the Darlington, Stockton, and Middlesbrough Registration Districts combined, whilst the corresponding rates were 3·5 and 1·5 on the population of 251,640 living in the remaining seven Registration Districts. And, after adding to each of the two six-weeks’ periods a further period, with a view of including, in each instance, the fever deaths referable to attacks during the outbursts in question, it was found that in two periods of 3½ months each, one terminating in

the second week of December 1890, and the other in the third week of March 1891, the death rate from Enteric Fever in the three first-named Registration Districts was in the former more than three times, and in the latter five times greater than in the other seven Registration Districts. In short, whether judged by attacks or by deaths, there was in a group of 10 Registration Districts, the majority of which had, according to the Registrar-General, habitual excess of Enteric Fever, a quite exceptional excess during the two periods referred to in the Registration Districts of Darlington, Stockton, and Middlesbrough. And not only so, but in no other of the remaining seven Registration Districts did excess of Enteric Fever corresponding to these two outbursts take place at the periods in question.

The 10 Registration Districts referred to contain 32 Sanitary Districts, and when the incidence of the fever on Sanitary Areas was examined it was found that the excess of attack rate was limited to 10 out of the 32 Sanitary Districts; that 9 of the 10 were amongst the 11 Sanitary Districts comprised within the Registration Districts of Darlington, Stockton, and Middlesbrough; and that the remaining Sanitary District (Kirkleatham Urban, situate at the mouth of the Tees) was comprised in the Guisbrough Registration District, an area which, when taken as a whole, had not shown excess of fever incidence. Out of the 1,463 attacks of Enteric Fever in the two special periods 1,352, or 92 per cent., occurred in the 10 Sanitary Districts referred to. The rate of attack per 10,000 living was 31 and 26 respectively for the two six-weeks' periods in the 10 Sanitary Districts, whereas it was only 3 and 1 respectively in the remaining 22 Sanitary Districts. And it is noteworthy that, whether judged by attack or by death the special outburst of the fever in the 10 Sanitary Districts was most conspicuous as regards the second of the two epidemic periods—28th December 1890 to 7th February 1891—a period in which, as Dr. Barry points out, Enteric Fever is unapt to be epidemic in this country. Of the 10 Sanitary Districts which were especially involved in these epidemic outbursts, eight were Urban Districts, namely Darlington, Stockton-on-Tees, Middlesbrough, South Stockton, Ormesby, Normanby, Eston, and Kirkleatham, and two were rural, namely Darlington and Stockton. In the Urban Districts the disease was general throughout their areas; in the Rural Districts it was limited to particular localities only.

Having ascertained that the special incidence of the fever during the two six-weeks' periods was upon these 10 Sanitary Districts, Dr. Barry made a careful inquiry into the general sanitary circumstances of these districts, dealing especially with the questions of house accommodation, excrement and refuse disposal, and sewerage and drainage. He also inquired into the circumstances of milk distribution. As regards the latter, it will readily be understood that no community of milk supply could be discovered over the wide area involved. As regards general sanitary circumstances, a number of places were found more or less faulty. In one case the faults related to house accommodation and to overcrowding of dwellings on area; in another it had to do with defective arrangements as to closet accommodation, whether waterclosets, pan-closets, or midden privies; in a third it was concerned with a deficient system of sewers or of drainage; and in yet another with two or more of these defects combined. But no community of any such sanitary circumstance could be found to affect the several areas invaded by the fever. And not only so, but amongst localities where precisely similar faults, in one or other of the respects named, did prevail, some places suffered severely, whilst others enjoyed almost complete immunity from fever.

The matter was, however, quite different when the question of water supply came to be considered. There was found to exist in the 10 Sanitary Districts which suffered especially from fever a general community of circumstance in this respect, the water in question being pumped from the River Tees, and being, after a process of sand filtration, distributed either through the works of the Darlington Corporation or through those of the Stockton and Middlesbrough Water Board. The whole of the houses in the urban districts of Middlesbrough, Stockton-on-Tees, and South Stockton received this water, nearly the whole of the houses in the Urban District of Darlington, and about one-fifth of those in the Darlington Rural District were so supplied; and considerable portions of the Urban Districts of Normanby, Ormesby, Eston, Kirkleatham, and of the Rural Sanitary District of Stockton were similarly provided with water. In fact, out of a total of 93,974 inhabited houses (having in 1891 an enumerated population of 503,616 persons) in the 32 Sanitary Districts included within the 10 Registration Districts forming the area of inquiry, 39,566 (with an estimated population of 219,435 persons) were supplied with Tees water, and of this number all but 447 houses (with an estimated population of 2,072 persons) were within the 10 Sanitary Districts which were found to have suffered from excess of fever in

the two epidemic periods. Here at last, in the matter of water supply, was a circumstance differentiating populations within the area under investigation. As already noted above, the estimated population receiving their water supply from the Tees amounted to 219,435, whereas the estimated population receiving their water supply from other sources than the Tees reached 284,181. Calculating the attack rates upon these figures, it was found that the rate of attack from Enteric Fever per 10,000 living during the first six-weeks' epidemic had been 33 amongst persons supplied with the Tees water, and 3 amongst persons supplied with other water; whereas in the second six-weeks' epidemic the rates were 28 and 1 respectively. Indeed, during two periods together, for every single person who contracted Enteric Fever amongst the population not using the Tees water, 15 contracted it amongst those who were supplied from the river.* Nearly parallel results were obtained when the incidence of the disease on these populations was judged of as regards death from Enteric Fever.

The question, therefore, obviously arises: Were there any means by which the water delivered from the Tees could have served as a medium for conveying the specific contagion of Enteric Fever to its consumers?

Dr. Barry deals with this question at some length, and the answer to it is definite and unmistakable. Within the catchment basin of the Tees, above the intakes of the two water companies, the river receives "either directly or indirectly the drainage of some 20 villages and hamlets as well as that of the town of Barnard Castle," with its population of 4,341 (1891); besides washings of land heavily manured, at times with night soil, together with the drainage of graveyards and farmhouses. At Barnard Castle almost everything has been so contrived as to ensure, to the fullest, the fouling of the river by every conceivable form of filth. Reference to the Plates embodied in the report will show how public and private drains discharge upon the banks of the stream, whilst privies, urinals, and waterclosets deliver their contents on to the fore-shore. No attempt whatever is made to hide or disguise the fact of pollution of the river at this point; a common arrangement being to carry all liquid filth to openings made at different altitudes in the house-walls, or in retaining walls, to discharge along the river side. The river, having thus been utilised as a common sewer, it has been found convenient to make it also serve the purpose of public scavenger, and as a consequence the banks were found to be lined here with "20 or more loads of stinking refuse" there with "very large quantities" of "ashes, house-refuse, waste building material, and midden refuse," and yet further on with the refuse from gasworks, &c. At the date of Dr. Barry's visit, these masses "of stinking abominations" lay bare, exposed to the view of all, along the river banks awaiting the floods which periodically serve to wash the accumulated filth and refuse down stream as far as, and then beyond, the intakes of the two public water services. And Dr. Barry is not the only witness as to this well-nigh incredible condition of affairs. Thus, in 1875 the present Manager of the Stockton and Middlesbrough Water Board, then a member of the Middlesbrough Corporation, gave evidence before a Parliamentary Committee to the effect that the Tees was, at the point now in question, "an improper service" of water supply "from the pollutions that go into the river." The present Chairman of the Board stated that there was "the very strongest objection" to a "water which is drawn from a district above which there are 10,000 (now some 12,000) inhabitants whose sewage is flowing into the river;" and a member of the Water Board declared that in view of what he had seen he had not drunk the water since, so satisfied was he that it was "not fit for use." Expert evidence at different dates some 12 or 15 years later, namely, between 1887 and 1890, is all in the same direction. One witness testifies that the river side scene was "disgusting and offensive," including, as it did, masses "of nauseating odour and horrible appearance," together with cart-

* If it be contended that attack-rates based on notification returns made voluntarily cannot properly be compared with returns made under a compulsory system, a different comparison can easily be made by the aid of data supplied to me by Dr. Barry since the completion of his report. Certain Rural and Urban Sanitary Districts within the Tees area, each of them partly supplied with Tees water and partly not, and in all of which compulsory notification was in operation, can be compared as to their "fever" according as the inhabitants within these areas were, or were not, supplied with Tees water. Of such Rural Sanitary Districts Dr. Barry finds that on 8,991 people supplied with Tees water, the attack-rate from Enteric Fever during the two six-weeks' periods was 89.0 per 10,000 living, whereas on 14,442 people not supplied with Tees water the corresponding rate was only 6.2. Comparison of populations within such Urban Sanitary Districts gave similar results, and this, notwithstanding the inequality in the amount of the populations dealt with. Amongst 59,446 people who drank Tees water there were, during the same period, 304 attacks, or 51.1 per 10,000; whereas amongst persons not living in houses to which the Tees water was laid on, there were only six attacks, which gives a rate of 22.7 per 10,000. And all the six attacks were limited to the first of the two six-weeks' epidemic periods.

loads of rubbish "laid down in readiness for a flood to remove them"; another says that he "could scarcely have believed that such a disgraceful state of pollution of a river could have existed at this time of day (1887) anywhere in England," and that in times of flood "a very strong element of danger exists." And the conclusion based on a series of bacteriological examinations of water, made during the same year, is to the effect that "in flooded states of the river there is evidence of profound sewage contamination within the Darlington area" which "persists in the water of the Tees at the pumping station for the Darlington town supply."

That filth of such a character, in such abundance, and from such sources, should remain for any length of time free from the specific material of Enteric Fever could hardly be contended. As a matter of fact, the probabilities of the river receiving specific filth antecedent to the first outbreak are many; and it is known that numerous opportunities for such specific fouling arose immediately before the second epidemic period.

Whilst such a condition of things as is described can readily be understood as conveying from time to time, the particulate poison of Enteric Fever along with the Tees water, something more than the casual pollution of the river water by the specific poison of that disease, which must be an ever recurring risk, seems needed in order to explain the two exceptional outbursts with which Dr. Barry deals. Floods, occurring at the right moment, and carrying large masses of the filth with rapidity down the stream, up to, and past, the water intakes would however supply a reasonable explanation of the exceptional outbursts of the disease over the area supplied with the Tees water.

And, as a matter of fact, this is precisely what did happen. In the fortnight ending August 23rd, 1890, no less than 3.660 inches of rain were registered at Barnard Castle, and the river was recorded by the Inspector of the Tees Salmon Fishery Board as "much flooded" on August 13th, and "very much flooded," on August 23rd. With the 7th of September the first six-weeks' epidemic set in.

In just the same way the second six-weeks' epidemic period which commenced December 28th was preceded by flood in the Tees, namely, by an eight-foot flood in the beginning of December, due to melting of snow that had fallen in great abundance towards the end of November.

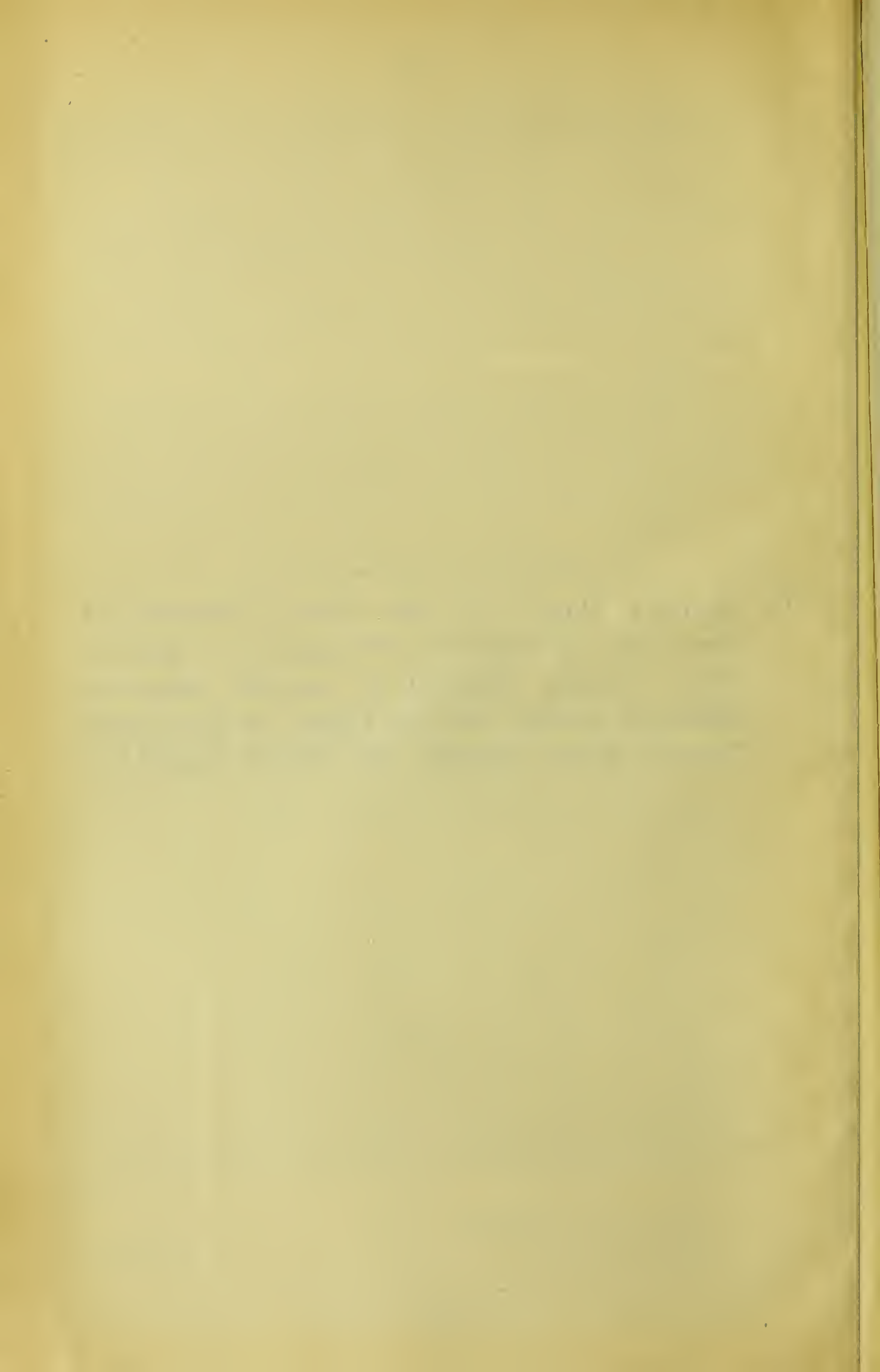
To summarise:—Over a wide area covering 706,020 acres, or 1,103 square miles, and containing 503,616 inhabitants, Enteric Fever has for years past been unduly prevalent. Within this area, where the infective material is thus constantly ready to hand, there occur in 10 Sanitary Districts, covering 117,404 acres, and containing a population of 217,363, two marked and sudden outbursts of Enteric Fever, each of large amount; the remaining area meanwhile exhibiting, as regards its constituent sanitary districts, comparatively insignificant "fever" rates. One of the outbursts is at a time of year when, apart from some exceptional and unusual factor Enteric Fever is not apt to prevail in epidemic form in this country. Within the sanitary districts invaded by the two epidemic prevalences, some localities suffer heavily, whilst others escape exceptional incidence to the disease. One factor alone is found to be common to the places thus suffering exceptionally from Enteric Fever, and this is the use of water pumped from the river Tees. This river is found to be at all times subject to conditions of the grossest fouling by reason of the fact that human excreta and other filth are knowingly and deliberately conveyed to it. Opportunities for the access of the specific material of Enteric Fever to the river had been constantly recurring. And, immediately antecedent to the epidemic outbursts, sudden floods washed vast masses of the filth which had been accumulating on the banks of the river down the stream up to, and past, the points of intake from which the water was being pumped, and, after filtration through sand and gravel, delivered to certain populations. These populations it was who suffered from the two exceptional prevalences of Enteric Fever. Seldom, if ever, has a case of the fouling of water intended for human consumption, so gross or so persistently maintained, come within the cognizance of the Medical Department, and seldom, if ever, has the proof of the relation of the use of water so befouled to wholesale occurrence of Enteric Fever been more obvious and patent.

I have, &c.

R. THORNE THORNE.

August 1893.

Dr. Barry's Report to the Local Government
Board on the Epidemic Prevalence of Enteric
Fever during 1890-91 in certain Sanitary
Districts situate in the Valley of the River
Tees in South Durham and North Yorkshire.



MAP I.

Showing the topographical relations of the Ten Registration Districts situate immediately to the North and South of the River Tees.



Dr. Barry's Report to the Local Government Board on the Epidemic Prevalence of Enteric Fever during 1890-91 in certain Sanitary Districts situate in the Valley of the River Tees in South Durham and North Yorkshire.

IN the following Report an account is given of inquiries upon which I was engaged during the winter of 1890-91, with respect to two series of outbreaks of Enteric Fever which occurred in certain districts situate in the valley of the River Tees, the one in September and October 1890, the other in January 1891. The earlier of these series of outbreaks has already been partially dealt with in an interim Report issued in January 1891, which was prepared in accordance with the Board's directions for the information and guidance of the Sanitary Authorities concerned. Whilst this interim Report was passing through the press, the second series of outbreaks of Enteric Fever occurred. Both series are included in the present Report.

ENTERIC
FEVER IN THE
TEES VALLEY,
1890-91; BY
DR. BARRY.

Introduction.

The delay in the appearance of this Report has been due to the fact that at the time when the inquiry was made, nearly 10 years had elapsed since the date of the previous Census. Consequently no reliable data existed as to the population of the districts concerned, and it was considered desirable to reserve the complete account of the epidemic until the results of the Census of 1891 were obtained. Since the issue of the Preliminary Census Report in the autumn of 1891, up to the present time (October 1892), the pressure of other important official work has not allowed my devoting the necessary time to the arrangement of the abundant data collected during the inquiry.

I.—INCIDENCE OF ENTERIC FEVER ON REGISTRATION DISTRICTS.

The Registration Districts to which my attention was first directed were those of Darlington, Stockton, and Middlesbrough, in each of which Enteric Fever was stated to have become exceptionally prevalent during the earlier weeks of September 1890. In order to ascertain the range, and, at the same time the limitations of the epidemic prevalence of Enteric Fever with which I was concerned, I extended my inquiry beyond the Registration Districts in question to other seven Registration Districts, namely, to Teesdale, Auckland, Hartlepool, Guisbrough, Stokesley, Northallerton, and Richmond, all of which abut directly upon the three districts already referred to. And from the Medical Officers of Health of each of the Sanitary Districts comprised in these 10 Registration Districts I obtained returns of the number of new cases of Enteric Fever which had come to their knowledge day by day from January 1st, 1890, to the end of March 1891. In some places where "notification" was not in force, the information given by the local Medical Officers of Health was supplemented by returns supplied to me by private medical practitioners. In like manner, and, as regards each Sanitary District, I obtained detailed returns of the several deaths registered as due to Enteric Fever in the 10 Registration Districts during the period July 1st, 1890, to June 30th, 1891. The preliminary information thus collected respecting the facts that required explanation, has been embodied in Map. I. and in Table I.

*Incidence of
Enteric Fever
on Registration
Districts.*

Map. I. exhibits the topographical relations of the 10 Registration Districts that are here being dealt with.

Table I. gives the number of cases of Enteric Fever reported to have occurred, Attacks.
fortnight by fortnight, in the 10 Registration Districts during the 32 fortnights ended March 21st, 1891.

Table II. repeats the facts of Table I., fortnight by fortnight, rateably to the population enumerated at the Census of 1891.

TABLE I.

Showing, Fortnight by Fortnight, for each of the TEN REGISTRATION DISTRICTS within the AREA of the TEES Inquiry the Number of ENTERIC FEVER ATTACKS reported during each of the 32 FORTNIGHTS ended 21st MARCH 1891.

Registration District.		Popu- lation, 1891.	New Cases of Enteric Fever reported during the Fortnights ended																								Total Attacks from Enteric Fever during											
			1890.																								1891.											
			11 January.	23 January.	8 February.	22 February.	8 March.	22 March.	5 April.	19 April.	3 May.	17 May.	31 May.	14 June.	28 June.	12 July.	26 July.	9 August.	23 August.	6 September.	20 September.	4 October.	18 October.	1 November.	15 November.	29 November.	13 December.	27 December.	10 January.	24 January.	7 February.	21 February.	7 March.	21 March.	32 Fortnights ended 21 March 1891.	3 Fortnights ended 18 Oct. 1890 (Cols. 21-23.)	3 Fortnights ended 7 Feb. 1891 (Cols. 24-30.)	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.	32.	33.	34.	35.	36.	37.		
Teesdale	-	20,963	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	-	-	-	-	-	1	1	-	-	-	-	6	3	2	37.	
Auckland	-	88,998	6	2	7	4	-	3	-	1	4	-	1	1	1	3	1	2	1	2	23	17	4	4	-	2	3	4	2	2	2	1	1	100	42	6	18	42.
Darlington	-	49,512	3	4	1	7	4	2	1	3	4	3	-	-	2	1	-	1	3	61	53	26	6	6	6	11	4	6	33	18	13	5	7	4	292	140	64	
Stockton	-	81,251	6	12	12	13	11	14	14	8	7	7	5	5	8	5	6	7	4	15	57	75	79	39	19	20	20	29	94	59	48	21	17	12	748	211	201	
Hartlepool	-	63,697	-	3	2	1	2	6	2	4	2	2	2	4	3	5	6	3	5	2	6	5	13	6	4	3	4	5	4	4	4	5	5	122	24	12	122	24
Northallerton	-	11,272	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	-	3	1	-	3	1
Stokesley	-	11,119	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	1	-	1	2	-	-	-	-	-	8	2	3	8	2
Middlesbrough	-	121,213	10	28	25	34	45	26	26	7	8	11	18	12	15	11	12	11	24	23	114	168	98	76	55	33	20	51	181	101	56	56	35	31	1,421	380	358	
Guisborough	-	39,986	4	5	2	-	-	1	-	2	2	-	-	-	-	1	1	1	-	-	2	6	9	-	1	-	-	4	6	6	3	2	-	-	58	17	15	
Richmond	-	12,635	-	-	-	-	-	3	1	-	-	-	-	-	1	-	-	1	-	-	-	2	-	-	2	-	1	-	-	-	-	-	-	11	2	-	11	2
Total	-	503,616	29	54	50	59	62	56	44	24	20	28	28	22	27	26	29	23	37	45	243	332	247	131	88	69	51	101	323	191	127	84	66	53	2,769	822	641	

TABLE II.

Showing, Fortnight by Fortnight, for each of the TEN REGISTRATION DISTRICTS within the Area of the TEES INQUIRY, the ATTACK RATE from ENTERIC FEVER, per 10,000 Population, enumerated in 1891, during the 32 FORTNIGHTS ended 21st MARCH 1891.

Registration Districts.			Fortnightly Attack Rates from Enteric Fever per 10 000 of the Population enumerated in 1891 during Fortnights ended																															Mean Fort- nightly Attack Rates from Enteric Fever during	
			1890.																1891.																
			11 January.	23 January.	8 February.	22 February.	8 March.	22 March.	5 April.	19 April.	3 May.	17 May.	31 May.	14 June.	28 June.	12 July.	26 July.	9 August.	23 August.	6 September.	20 September.	4 October.	18 October.	1 November.	15 November.	29 November.	13 December.	27 December.	10 January.	24 January.	7 February.	21 February.	7 March.		
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.	32.	33.	34.	35.	36.
Teesdale	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.5	.5	.5	.5	-	-	-	-	-	.5	.5	-	-	-	-	0.09	0.48	0.29
Aneklund	-	.7	.2	.8	.45	-	.3	-	.1	.45	-	.1	.1	.1	.3	.1	.2	.1	.2	2.6	1.9	.45	-	-	.3	.45	.2	.2	.2	.1	.1	0.35	1.57	0.23	
Darlington	-	.6	.8	.2	1.4	.8	.4	.2	.6	-	.8	-	-	.4	.2	-	.2	.9	12.3	10.7	5.2	1.2	1.2	2.2	.8	1.2	6.7	3.6	2.6	1.4	.8	1.84	9.42	4.31	
Stockton	-	.7	1.5	1.5	1.6	1.4	1.7	1.7	1.0	.9	.6	.6	1.0	.6	.7	.9	.5	1.8	7.3	9.3	9.7	4.8	2.3	2.5	2.5	3.6	1.6	7.3	5.9	2.6	2.1	1.5	2.88	8.66	8.25
Hartlepool	-	-	.45	.3	.15	.3	.9	.3	.6	.3	.3	.6	.45	.8	.9	.45	.8	.3	.9	.8	1.9	.9	.6	-	.6	.8	.6	.6	.75	.75	.57	1.20	0.60		
Northallerton	-	-	-	.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.9	-	-	-	-	-	-	-	-	.9	-	-	0.08	0.27	0.00
Stokesley	-	-	-	-	-	-	.9	-	-	-	-	-	-	-	-	-	-	-	-	.9	.9	-	.9	-	-	-	1.8	-	-	-	-	-	0.18	0.51	0.90
Middlesbrough	-	.8	2.3	2.1	2.8	3.7	2.1	2.1	.6	.7	.9	1.5	1.2	.9	1.0	.9	2.0	1.9	9.4	13.9	8.1	6.3	4.5	2.7	1.7	4.2	14.9	8.3	4.6	2.9	2.6	3.67	10.46	9.30	
Guisbrough	-	1.0	1.25	.5	-	-	.25	-	.5	.5	-	-	-	.25	.25	.25	-	-	.5	1.5	2.2	-	.25	-	-	1.0	1.5	1.5	.75	.5	-	0.45	1.40	1.25	
Richmond	-	-	-	-	-	-	2.4	.8	-	-	-	-	-	.8	-	-	.8	-	-	-	1.6	-	1.8	-	-	.8	-	-	-	-	-	0.24	0.23	0.00	
	.6	1.1	1.0	1.2	1.2	1.1	.9	.5	.4	.6	.6	.4	.5	.5	.6	.5	.7	.9	4.8	6.6	4.9	2.6	1.7	1.4	1.0	2.0	6.4	3.8	2.5	1.7	1.3	1.72	.44	4.24	

ENTERIC
FEVER IN THE
TEES VALLEY,
1890-91; BY
DR. BARRY.
Registration
Districts.
Attacks.

Registration
Districts.

Attacks.

Table I. shows that of 2,769 cases of Enteric Fever reported as having occurred during the 32 fortnights (January 1890 to March 1891) in the 10 Registration Districts, no less than 2,461 (89 per cent.) occurred in *three* of these districts, namely, in Darlington, Stockton, and Middlesbrough.

Further, this table shows that of the 2,769 cases in question 1,463 (53 per cent.) occurred in *three* out of the 16 months* under consideration; namely, in two periods, each of six weeks—September 7th to October 18th, 1890, and December 28th, 1890, to February 7th, 1891.

Similarly, the table shows that of the 1,463 attacks in the three months referred to, no less than 1,334 (91 per cent.) occurred in the Darlington, Stockton, and Middlesbrough Registration Districts.

The facts contained in Tables I. and II. have been summarised in the following Table III. rateably to population.

TABLE III.

ATTACKS per 10,000 Population in each instance.														
The Ten Registration Districts selected for Inquiry.				16 Months (Jan. 1890 to Mar. 1891).	Two Periods, each of Six Weeks, <i>Collectively.</i>	First Six Weeks' Period (7th Sept.- 18th Oct. 1890).	Second Six Weeks' Period (28th Dec. 1890- 7th Feb. 1891).							
THREE REGISTRA- TION DISTRICTS.	{	DARLINGTON	- -	59·0	98	{	41·2	53	{	28·3	29	{	12·9	24
		STOCKTON	- -	92·1			50·8			26·0			24·6	
		MIDDLESBROUGH	- -	117·4			59·4			31·4			27·9	
OTHER SEVEN REGISTRA- TION DISTRICTS.	{	Teesdale	- -	2·9	12	{	2·4	5	{	1·4	3·5	{	0·9	1·5
		Auckland	- -	11·2			5·4			4·7			0·7	
		Hartlepool	- -	18·3			5·4			3·6			1·8	
		Northallerton	- -	2·7			0·9			0·9			0·0	
		Stokesley	- -	7·2			4·5			1·8			2·7	
		Guisbrough	- -	14·5			8·0			4·3			3·8	
		Richmond	- -	8·7			1·6			1·6			0·0	

Hence it appears that for the whole period of 16 months the rate, *collectively and severally*, of Enteric Fever attack in Darlington, Stockton, and Middlesbrough outrageously exceeded that of the other seven Registration Districts; that this excess of incidence on these three districts was more marked in the two six-week-periods taken together than in the whole sixteen months, and that it was most conspicuous of all in the second six-week-period, namely, from 28th December 1890 to 7th February 1891.

This different behaviour of Enteric Fever in each of the 10 Registration Districts during the 16 months in question is further illustrated in detail, fortnight by fortnight, by the annexed Diagram I.

From this diagram the similarity of the behaviour of Enteric Fever in Darlington, Stockton, and Middlesbrough will be at once seen. The only other districts in which similar behaviour, but on a greatly reduced scale, is observable, are those of Guisbrough and Auckland. As to Guisbrough more will appear in the sequel;† but as regards Auckland it is to be noted that similarity of behaviour is limited to the *first six-week-period only* (7th September to 1st November 1890), and that the exceptional fever there did not occur until the latter half of the period in question.

Explanation is of course wanted, not only of the excess of Enteric Fever in Darlington, Stockton, and Middlesbrough, but also and especially of the disproportionately large excess as compared with other districts witnessed in the six weeks, 28th December 1890 to 7th February 1891; at a time of year that is, when Enteric Fever is—unless very special conditions favour its dissemination—unapt to become epidemic in this country.

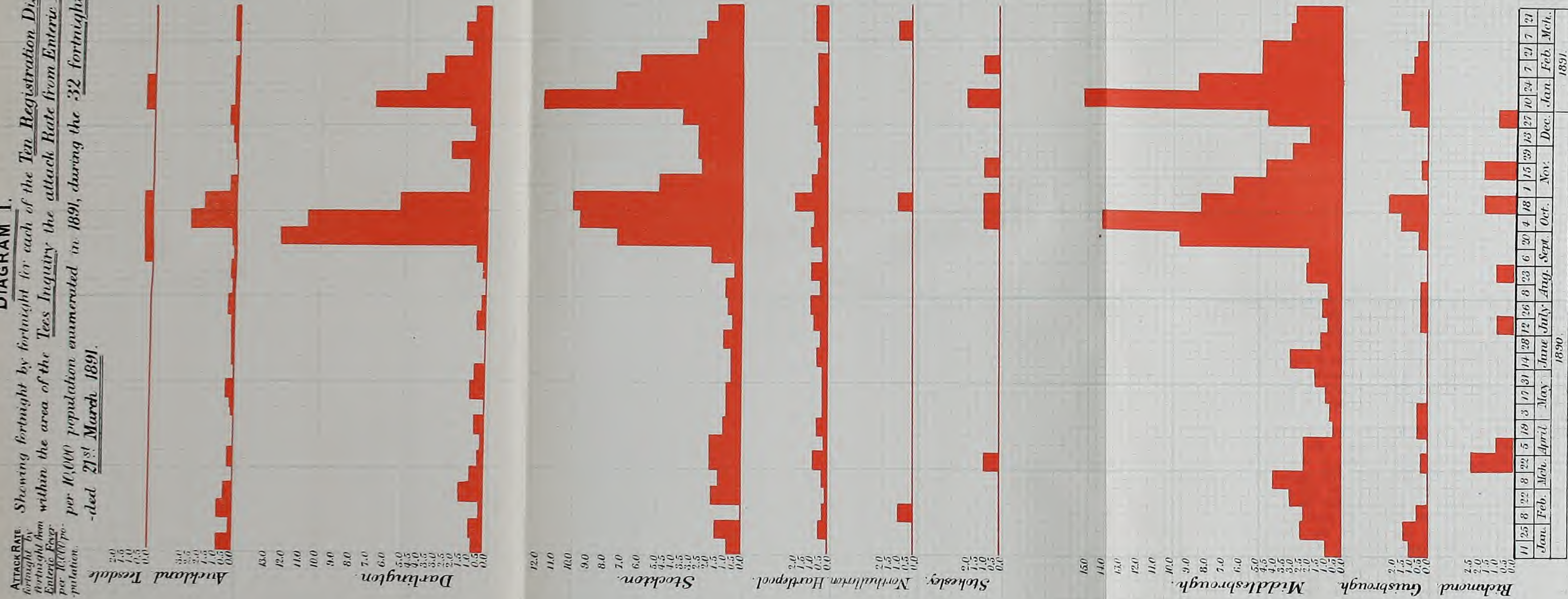
Mortality.

The above data of course refer to Enteric Fever *attack* only, and since it might be objected that comparisons in the above sense are not to be trusted for the reason that for some of the districts the data are “notification returns,” whereas for others these are voluntary returns made at my instance and some time later than the occurrences to which they refer, I have been at the trouble to check my figures by mortality statistics. For this purpose I have used the mortality returns furnished to the Medical Officers of Health of the Sanitary Districts comprised within the 10 Registration Districts with which I am concerned, and have extracted therefrom the Enteric Fever deaths in the 26 fortnights ended 27th June 1891, so as to cover the whole period of epidemicity of that disease in the area under investigation.

The facts with respect to Enteric Fever mortality are set out in detail in Table IV.

* By “month” the lunar month of four weeks is always here to be understood. † See pages 13 and 45, *post*.

DIAGRAM I.
 Showing fortnight by fortnight for each of the Ten Registration Districts within the area of the Tees Inquiry the attack rate from Enteric Fever per 10,000 population enumerated in 1891, during the 32 fortnights ended 21st March 1891.



To face page 6

FORTNIGHTS ENDING

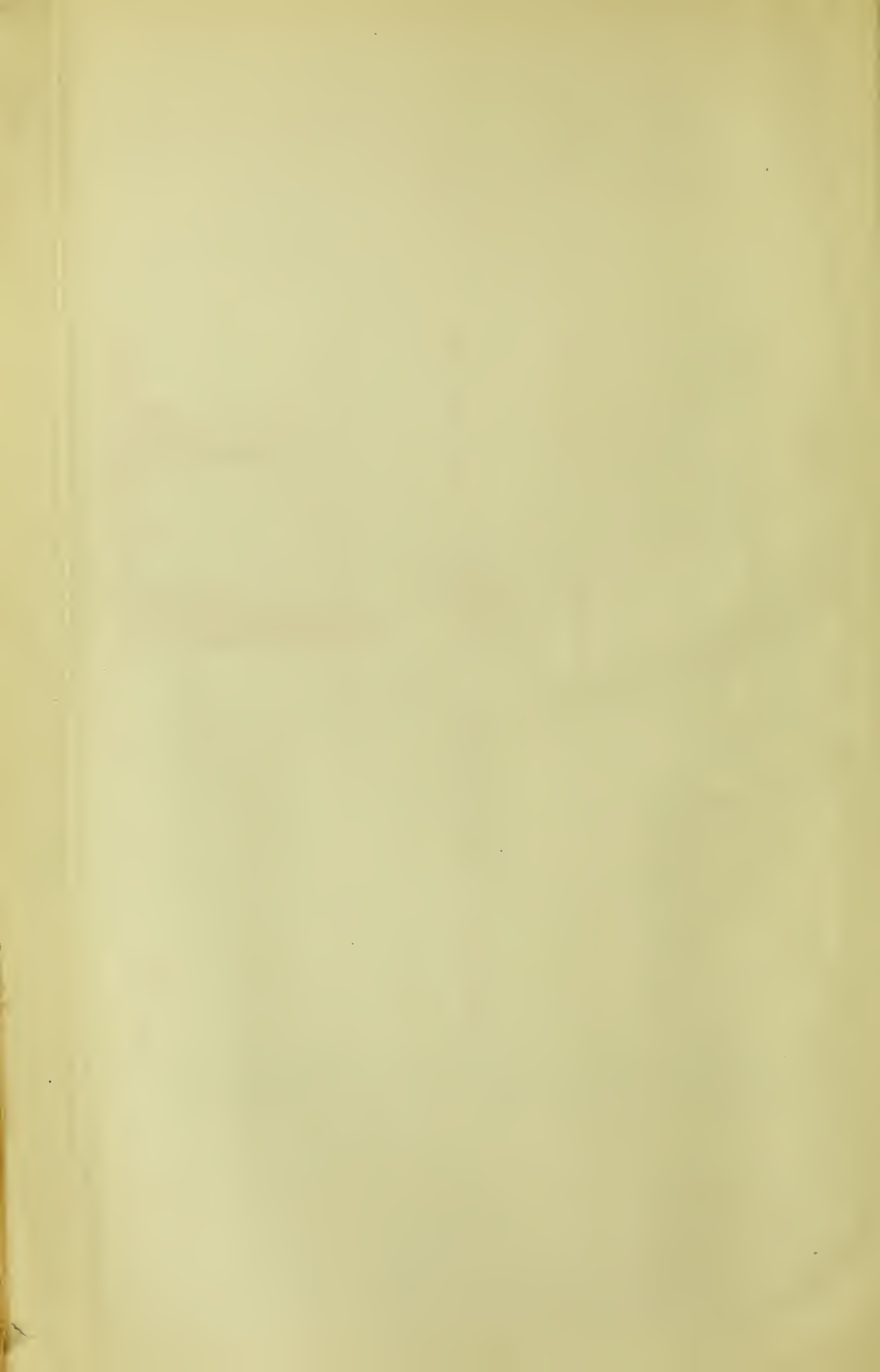


TABLE IV.

Showing, Fortnight by Fortnight, for each of the TEN REGISTRATION DISTRICTS within the Area of the TEES INQUIRY, the Deaths registered from ENTERIC FEVER during the 52 WEEKS ended 27TH JUNE 1891.

Registration District.	Popu- lation, 1891.	Deaths registered from Enteric Fever during the Fortnights ended																												Total Deaths from Enteric Fever recorded during Year ended 27 June 1891.	Total Deaths registered during			Annual Rate of Mortality from Enteric Fever per 10,000 of the Population June 1891.
		1890.														1891.																		
		12 July.	26 July.	9 August.	23 August.	6 September.	20 September.	4 October.	18 October.	1 November.	15 November.	29 November.	13 December.	27 December.	10 January.	24 January.	7 February.	21 February.	7 March.	21 March.	4 April.	18 April.	2 May.	16 May.	30 May.	13 June.	27 June.							
L.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.	32.	33.		
Teesdale	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	0.48		
Auckland	-	1	1	1	-	1	2	4	8	4	3	2	2	2	2	1	-	3	1	2	1	2	-	1	1	-	-	45	36	25	11	5.05		
Darlington	-	1	-	-	-	-	2	5	4	3	3	-	4	-	2	1	3	-	2	1	3	-	-	-	-	-	-	34	30	21	9	6.87		
Stockton	-	1	-	1	2	-	1	8	2	4	8	5	4	1	7	14	9	2	2	4	3	3	4	-	-	-	-	85	71	32	39	10.47		
Hartlepool	-	3	-	3	1	3	-	4	1	1	-	-	-	1	1	2	1	-	-	-	1	-	1	-	-	-	24	11	6	5	3.60			
Northallerton	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	0.89			
Stokesley	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	-	0.90			
Middlesbrough	-	5	2	2	4	3	4	8	14	11	9	14	7	2	7	21	17	3	4	4	2	2	2	1	1	4	1	134	125	67	58	12.70		
Guisbrough	-	-	-	1	2	-	-	1	-	1	-	-	-	2	-	2	1	-	-	-	-	-	-	-	1	-	-	11	7	2	5	2.75		
Richmond	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2	2	-	1.58			
Total	-	11	3	8	10	7	9	30	30	25	24	21	18	8	19	41	31	8	9	11	10	7	7	2	3	4	2	358	284	157	127	7.12		

ENTERIC
FEVER IN THE
TEES VALLEY,
1890-91; BY
DR. BARRY.
Registration
Districts.
Mortality.

Table IV. shows that of 358 deaths from Enteric Fever in the 26 fortnights ended June 27th, 1891, in the 10 Registration Districts, no less than 273 (76 per cent.) occurred in Darlington, Stockton, and Middlesbrough.

Registration
Districts.
Mortality.

Further, the table shows that of the 358 Enteric Fever deaths in question, 284 (79 per cent.) occurred in the seven months, 7th September 1890 to 21st March 1891.

Similarly, the table shows that of the 284 Enteric Fever deaths in the seven months referred to, no less than 226 (80 per cent.) occurred in Darlington, Stockton, and Middlesbrough Registration Districts.

Rateably to population the facts of Table IV. are summarised in the following Table V.

TABLE V.

The Ten Registration Districts selected for Inquiry.		DEATHS per 10,000 Population in each instance.			
		13 Months to 27 June 1891.	7 Months to 21 Mar. 1891.	3½ Months to 13 Dec. 1890.	3½ Months to 21 Mar. 1891.
THREE REGISTRA- TION DISTRICTS.	DARLINGTON - -	6·9	6·1	4·2	1·8
	STOCKTON - -	10·5	8·7	3·9	4·8
	MIDDLESBROUGH -	12·7	9·9	5·5	4·8
OTHER SEVEN REGISTRA- TION DISTRICTS.	Teesdale - - -	0·5	0·5	0·5	0·0
	Auckland - - -	5·0	4·0	2·8	1·2
	Hartlepool - - -	3·6	1·7	0·9	0·8
	Northallerton - -	0·9	0·0	0·0	0·0
	Stokesley - - -	0·9	0·9	0·9	0·0
	Guisbrough - - -	2·7	1·7	0·5	1·2
	Richmond - - -	1·6	1·6	1·6	6·0

The different incidence of Enteric Fever mortality in each of the 10 Registration Districts during the 13 months ended 27th June 1891 is further illustrated in Diagram II. annexed.

Comparison, then, of Diagrams I. and II., of the facts of Tables I. and IV., and of the data adduced therefrom, suffices to indicate that the *attack* rates I have been dealing with may be trusted for the purpose I have in view. In regard of Auckland alone are they found to have in any considerable degree understated the total amount of Enteric Fever. But for this district, as for other districts, they may be relied on as showing the season of chief prevalence of fever, since they are corroborated by the death-rates in their indication that Auckland did not participate to any large extent in the renewal in the early part of 1891 of epidemic Enteric Fever in the group of districts more particularly in question.

II.—INCIDENCE OF ENTERIC FEVER ON SANITARY DISTRICTS.

Incidence of
Enteric Fever
on Sanitary
Districts.

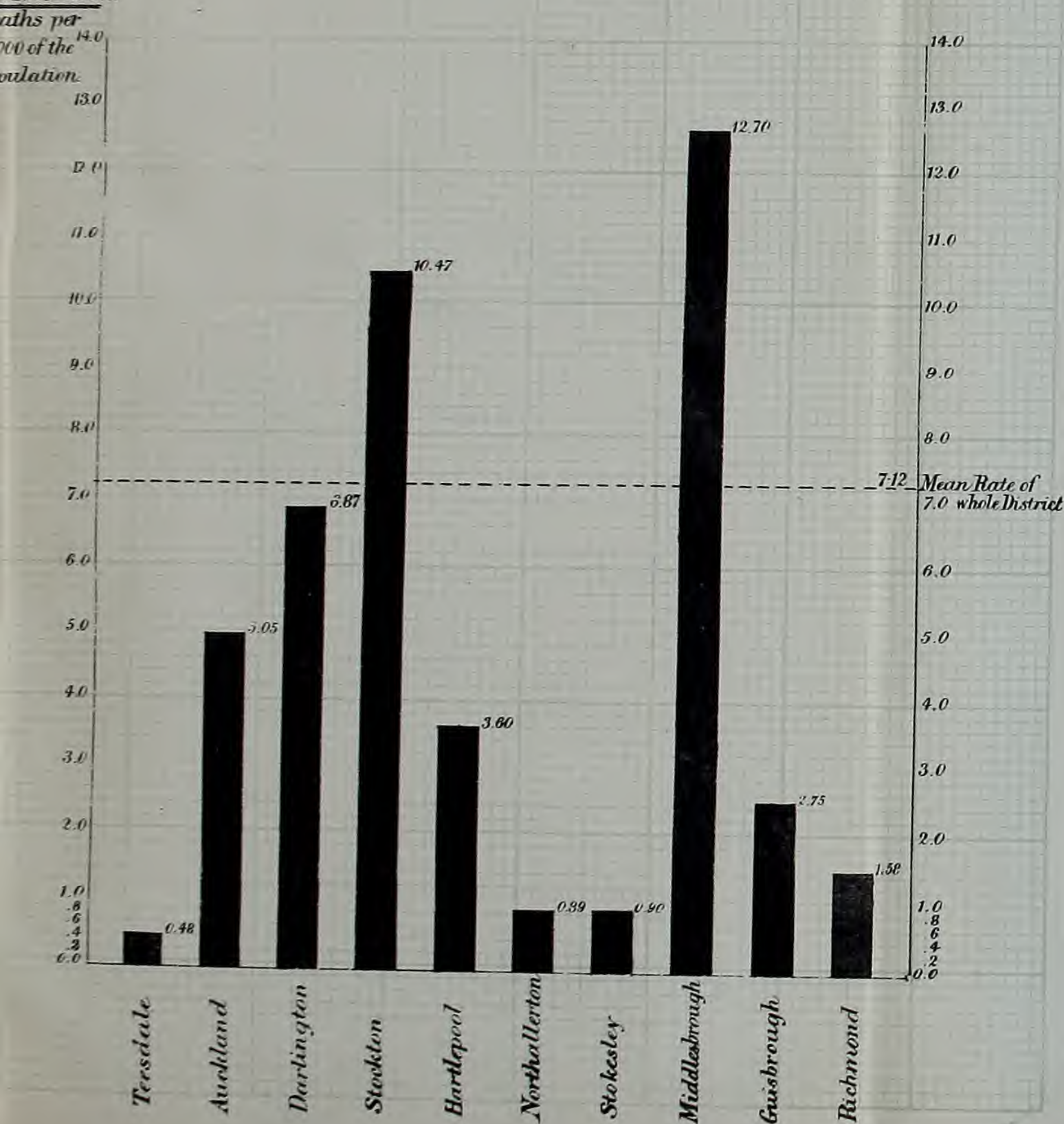
Population,
&c.

Having considered the relative incidence of Enteric Fever on the several Registration Districts comprised within the area of inquiry, I now propose to subdivide the Registration Districts into their constituent Sanitary Districts, in order to ascertain how far exceptional incidence of Enteric Fever on Sanitary Districts has been limited to, or has extended beyond the three Registration Districts more particularly in question. In Table VI. will be found a list of the Sanitary Districts comprised within the ten Registration Districts included in the area of inquiry, together with their areas and populations, as ascertained at the censuses of 1881 and 1891, and the number of inhabited houses enumerated in 1891.

DIAGRAM II.

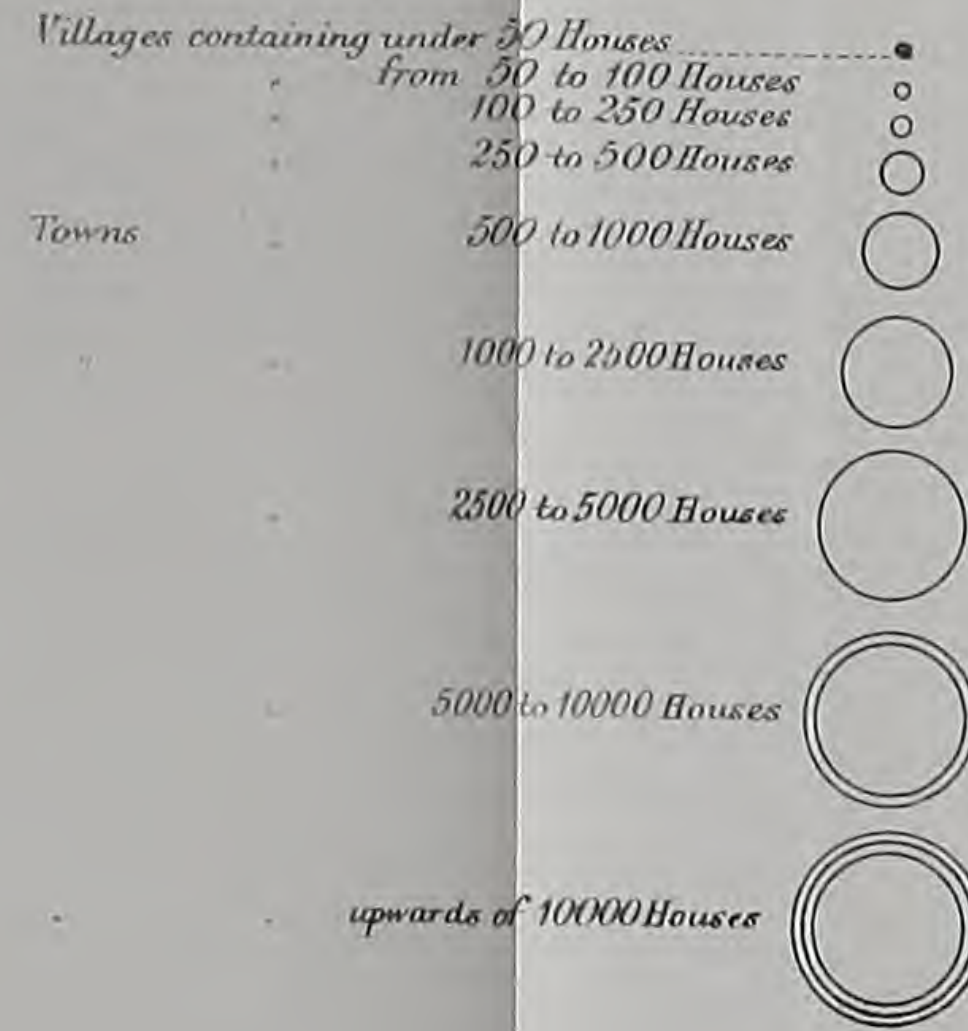
Shewing for each of the Ten Registration Districts within the area of the Tees Inquiry, the Death Rate from Enteric Fever, per 10,000 population enumerated in 1891, during the 52 Weeks ended 27th June 1891.

ENTERIC FEVER.



References.

- I Teesdale rural Sanitary district.
- II Auckland
- III Sedgefield
- IV Hartlepool
- V Darlington
- VI Stockton
- VII Middlesbrough
- VIII Guisborough
- IX Stokesley
- X Northallerton
- XI Richmond
- 1 Spennymoor Urban
- 2 Bishop Auckland
- 3 Shildon
- 4 Barnard Castle
- 5 Darlington
- 6 Hartlepool
- 7 West Hartlepool
- 8 Stockton on Tees
- 9 South Stockton
- 10 Middlesbrough
- 11 Ormesby
- 12 Normanby
- 13 Easington
- 14 Kirkcubbin
- 15 Redcar
- 16 Guisborough
- 17 Skelton & Bratton
- 18 Saltburn by the Sea
- 19 Loftus
- 20 Northallerton
- 21 Richmond



MAP II

DIAGRAM MAP

SHewing THE

REGISTRATION & SANITARY DISTRICTS.

With the position of the principal Towns and Villages included therein situate immediately to the

NORTH & SOUTH OF THE RIVER TEES.

Scale 4 miles to 1 inch.

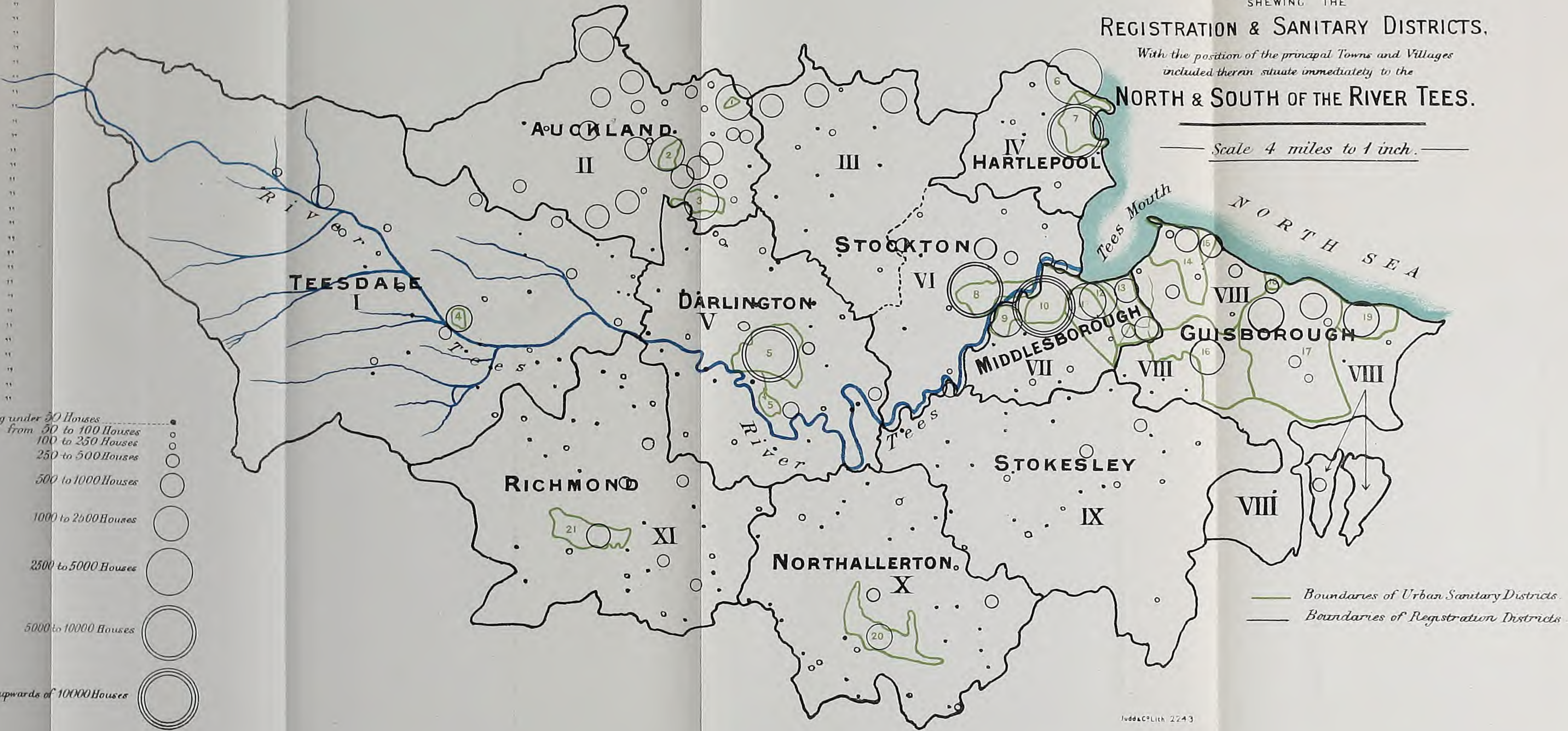


TABLE VI.

SHOWING the AREA and the ENUMERATED POPULATION at the CENSUSES of 1881 and 1891, together with the NUMBER of INHABITED HOUSES, 1891, in each SANITARY DISTRICT comprised within the AREA of the TEES INQUIRY.

Registration District.	Sanitary District.	Area in Acres, 1881.	Population, Census, 1881.	Population, Census, 1891.	Inhabited Houses, 1891.	Population, &c.
1.	2.	3.	4.	5.	6.	
Teesdale - - -	Teesdale, Rural* - -	177,714	16,681	16,622	3,408	
	Barnard Castle, Urban* - -	632	4,096	4,341	840	
	Auckland, Rural - -	62,259	58,854	62,893	12,217	
Auckland - - -	Bishop Auckland, Urban - -	950	10,097	10,527	1,991	
	Shildon and East Thicky, Urban. - -	1,066	8,704	9,537	1,978	
	Spennymoor, Urban - -	176	5,917	6,041	1,135	
Darlington - - -	Darlington, Urban - -	3,910	35,104	38,060	7,244	
	Darlington, Rural - -	61,795	12,572	11,452	2,370	
	Stockton-on-Tees, Urban* - -	1,189	41,660	49,731	9,770	
Stockton - - -	Stockton, Rural* - -	35,898	9,489	11,961	2,253	
	Sedgefield, Rural - -	45,367	17,103	19,559	3,578	
	Hartlepool, Urban* - -	546	16,998	21,521	3,283	
Hartlepool - - -	West Hartlepool, Urban* - -	2,510	29,448	42,492	7,502	
	Hartlepool, Rural* - -	18,180	2,167	2,654	443	
	Northallerton, Urban - -	3,650	3,692	3,802	785	
Northallerton - - -	Northallerton, Rural - -	63,350	8,192	7,490	1,674	
	Stokesley, Rural - -	79,708	12,009	11,119	2,442	
Stokesley - - -	Middlesbrough, Urban - -	2,731	55,934	75,516	13,306	
	South Stockton, Urban - -	1,052	10,665	15,476	2,696	
	Ormesby, Urban - -	2,836	7,719	8,629	1,558	
Middlesbrough - - -	Normanby, Urban - -	1,413	7,714	9,128	1,354	
	Eston, Urban* - -	2,250	6,297	16,695	1,924	
	Middlesbrough, Rural* - -	12,107	1,581	1,769	331	
Guisbrough - - -	Kirkleatham, Urban - -	4,330	3,898	4,209	841	
	Redcar, Urban - -	900	2,458	2,818	584	
	Guisbrough, Urban - -	7,014	6,616	5,623	1,137	
Guisbrough - - -	Skelton and Brotton, Urban - -	15,536	13,558	11,842	2,319	
	Saltburn-by-the-Sea, Urban - -	600	1,646	2,232	442	
	Loftus, Urban - -	2,550	6,699	6,208	1,275	
Richmond - - -	Guisbrough, Rural - -	52,758	8,251	7,054	1,441	
	Richmond, Urban - -	2,520	4,502	4,216	800	
	Richmond, Rural - -	78,582	8,956	8,419	1,783	
10	32	706,020	439,277	503,616	93,974	

* The boundaries of the districts marked thus have been changed since the date of the Census, 1881. In all such cases the enumerated population in 1881, as well as in 1891, relates to the new area.

It will be observed that 32 Sanitary Districts are comprised within the 10 Registration Districts; that these vary very greatly both in size and in the number of their inhabitants; and that of the 32 districts, 22 are urban and 10 rural.

In Map II. the topographical relations of the 32 Sanitary Districts are shown. It will be seen that the area of inquiry embraced the whole valley of the River Tees from a point near its source to the sea, and in addition areas lying immediately to the north and south of this valley.

Table VII.* gives the number of cases of Enteric Fever reported to have occurred, fortnight by fortnight, in each of the 32 Sanitary Districts comprised within the area of inquiry during the 32 fortnights ended 21st March 1891. This table corresponds with Table I., where the same cases were distributed according to the Registration Districts in which they occurred.

Table VIII. repeats for the Sanitary Districts the facts of Table VII. in the same manner that Table II. repeats for the Registration Districts the facts of Table I., fortnight by fortnight, rateably for the population enumerated at the Census of 1891.

* In considering this table it should be noted that the Infectious Diseases (Notification) Act, 1889, had been adopted and was in force in the Urban Sanitary Districts of Barnard Castle, Spennymoor, Darlington, Stockton-on-Tees, Hartlepool, West Hartlepool, Middlesbrough, South Stockton, Normanby, Eston, Kirkleatham, and Richmond; and in the Rural Sanitary Districts of Darlington, Stockton, Hartlepool, and Richmond; and that there was a system of voluntary notification in use in the Urban Sanitary Districts of Redcar, Guisbrough, Saltburn-by-the-Sea, and Loftus, and in the Rural Sanitary District of Guisbrough. Further, as regards the Urban Sanitary District of Ormesby and the Rural Sanitary Districts of Stokesley and Teesdale, I applied to every medical man I could hear of as practising in the districts for returns of cases of Enteric Fever coming to his knowledge in the period from the 24th August 1890, onwards, so that as regards these 24 districts it may be assumed that the figures as to Enteric Fever attacks are fairly accurate. In the Auckland Rural District, Enteric Fever was epidemic in one village only, that of Crook, and with respect to this a special report was called for by the Board from the Medical Officer of Health, so that most of the cases are here also doubtless recorded.

SHOWING, Fortnight, for each of the THIRTY-TWO SANITARY DISTRICTS within the AREA of the TEES INQUIRY, the NUMBER of ENTERIC FEVER ATTACKS reported from all SOURCES to have occurred during the THIRTY-TWO FORTNIGHTS ended 21ST MARCH 1891.

Number of new cases of Enteric Fever reported to have occurred during the Fortnights ended																										New Cases of Enteric Fever reported during																
Registration District.	Sanitary District.	Popu-lation, 1891.	1890.																				1891.																			
			11 January.	25 January.	8 February.	22 February.	8 March.	22 March.	5 April.	19 April.	3 May.	17 May.	31 May.	14 June.	28 June.	12 July.	26 July.	9 August.	23 August.	6 September.	20 September.	4 October.	18 October.	1 November.	15 November.	29 November.	13 December.	27 December.	10 January.	24 January.	7 February.	21 February.	7 March.	21 March.								
1.		3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.	32.	33.	34.	35.	36.	37.	38.	39.	40.			
Teesdale	Teesdale, R. Barnard Castle, U.	16,622 4,311	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Auckland	Auckland, R. Bishop Auckland, U. Shildon and East Thickley, U. Spennymoor, U.	62,893 10,527 9,537 6,041	1	1	1	3	1	1	1	1	1	1	1	1	1	1	3	1	1	-	2	17	14	4	-	1	3	2	2	1	2	-	-	-	-	58	16	33	5	-	1	
Darlington	Darlington, U.	38,060	1	4	1	7	4	2	1	2	-	4	3	-	-	2	-	-	-	3	55	45	24	4	4	6	6	3	3	27	12	11	3	6	4	245	124	50	14	19	182	
Stockton	Stockton, R. Stockton-on-Tees, U. Sedgefield, R.	11,452 49,731 11,961 19,559	2	11	10	11	11	13	12	7	4	7	4	5	8	4	6	6	3	12	50	62	57	31	16	17	11	15	86	50	46	19	13	11	623	169	182	40	19	19		
Hartlepool	Hartlepool, U. West Hartlepool, U. Hartlepool, R.	21,521 42,492 2,654	-	3	2	1	1	5	1	2	2	2	-	2	2	1	5	2	2	1	3	3	2	2	3	2	2	3	4	3	2	1	4	1	5	72	17	8	-	-	-	
Northallerton	Northallerton, U. Northallerton, R.	3,802 7,490	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	2	1	-	-	-	-	
Stokesley	Stokesley, R.	11,119	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	1	-	1	2	-	-	-	-	-	-	8	2	3	-	-	-	
Middlesbrough	Middlesbrough, U. South Stockton, U. Ormesby, U. Normaby, U. Eston, U. Middlesbrough, R.	75,516 15,476 8,629 9,128 10,615 1,769	4	20	8	17	21	16	19	4	1	4	10	10	10	5	8	8	23	10	74	94	70	49	40	26	17	29	121	74	32	36	23	23	905	298	227	49	19	23		
Guisbrough	Kirkcubbin, U. Redcar, U. Guisbrough, U. Skelton and Brotton, U. Saltburn-by-the-Sea, U. Lafius, U. Guisbrough, R.	4,200 2,818 5,623 11,842 2,282 6,298 7,054	1	-	1	-	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	-	6	1	1	1	1	3	4	6	2	2	-	-	-	29	8	12	1	-	-	
Richmond	Richmond, U. Richmond, R.	4,216 8,419	-	-	-	-	-	3	1	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	1	1	2	-	-	-	-	-	-	2	2	8	1	1	-	-
Total 10		508,616	29	54	50	59	62	56	44	24	20	28	28	22	27	25	29	23	37	45	243	332	247	131	88	69	51	101	323	191	127	84	66	53	2,769	822	641	-	-	-	-	-
			Mean fortnightly attacks 86.4.																																							

TABLE VIII.

SHOWING, Fortnight by Fortnight, for each of the THIRTY-TWO SANITARY DISTRICTS within the Area of the TEES INQUIRY, the ATTACK RATES from ENTERIC FEVER per 10,000 of the Population enumerated in 1891 during the THIRTY-TWO FORTNIGHTS ended 21st MARCH 1891, and the MEAN FORTNIGHTLY ATTACK RATES during the "First" and "Second Epidemic Period" respectively.

[illegible]

Mean fortnightly attack rate, 1.72.

Attacks.

*Sanitary
Districts.*

ENTERIC
FEVER IN THE
TREES VALLEY,
1890-91; BY
DR. BARRY.

The facts contained in Tables VII. and VIII. as regards Enteric Fever attack in Sanitary Districts have been summarized in the following Table IX. rateably to population in the same manner that the facts as regards Enteric Fever attacks in the Registration Districts contained in Tables I. and II. were summarized in Table III.

TABLE IX.

The Thirty-two Sanitary Districts comprised within the Ten Registration Districts selected for Inquiry.		Attacks per 10,000 Population in each instance.			
		16 Months (Jan. 1890 to Mar. 1891).	Two Periods, each of Six Weeks, <i>collectively.</i>	First Six Weeks' Period (7th Sept.- 18th Oct. 1890).	Second Six Weeks' Period (28th Dec. 1890- 7th Feb. 1891).
TEN SANITARY DISTRICTS.	DARLINGTON, U. -	61·4	45·7	32·6	13·1
	DARLINGTON, R. -	41·0	26·2	14·0	12·2
	STOCKTON, U. - -	124·8	70·6	34·0	36·6
	STOCKTON, R. - -	96·2	49·3	33·4	15·9
	MIDDLESBROUGH, U. -	120·0	61·6	31·5	30·1
	SOUTH STOCKTON, U. -	134·4	57·6	25·9	31·7
	ORMESBY, U. - -	108·8	55·5	28·9	26·6
	NORMANBY, U. -	101·9	74·3	47·0	26·2
	ESTON, U. - -	112·1	44·8	31·8	13·1
	KIRKLEATHAM, U. -	68·8	47·5	19·0	28·5
OTHER TWENTY-TWO SANITARY DISTRICTS.	Teesdale, R. - -	1·8	1·8	0·6	1·2
	Barnard Castle, U. -	6·9	4·6	4·6	0·0
	Auckland, R. - -	9·2	6·0	5·2	0·8
	Bishop Auckland, U. -	15·2	5·7	5·7	0·0
	Shildon and East Thick- ley, U.	6·3	1·0	1·0	0·0
	Spennymoor, U. -	33·2	5·0	3·3	1·7
	Sedgefield, R. - -	5·1	1·0	1·0	0·0
	Hartlepool, U. - -	23·2	5·1	3·2	1·9
	West Hartlepool, U. -	16·9	5·9	4·0	1·9
	Hartlepool, R. - -	0·0	0·0	0·0	0·0
	Northallerton, U. -	5·3	0·0	0·0	0·0
	Northallerton, R. -	1·3	1·3	1·3	0·0
	Stokesley, R. - -	7·2	4·5	1·8	2·7
	Middlesbrough, R. -	0·0	0·0	0·0	0·0
	Redcar, U. - -	7·1	3·6	0·0	3·6
	Guisbrough, U. -	0·0	0·0	0·0	0·0
	Skelton and Brotton, U.	16·0	7·6	5·9	1·7
	Saltburn-by-the-Sea, U.	0·0	0·0	0·0	0·0
	Loftus, U. - -	3·2	0·0	0·0	0·0
	Guisbrough, R. -	8·5	2·8	2·8	0·0
	Rielmond, U. - -	7·1	2·4	2·4	0·0
	Richmond, R. - -	9·5	1·2	1·2	0·0

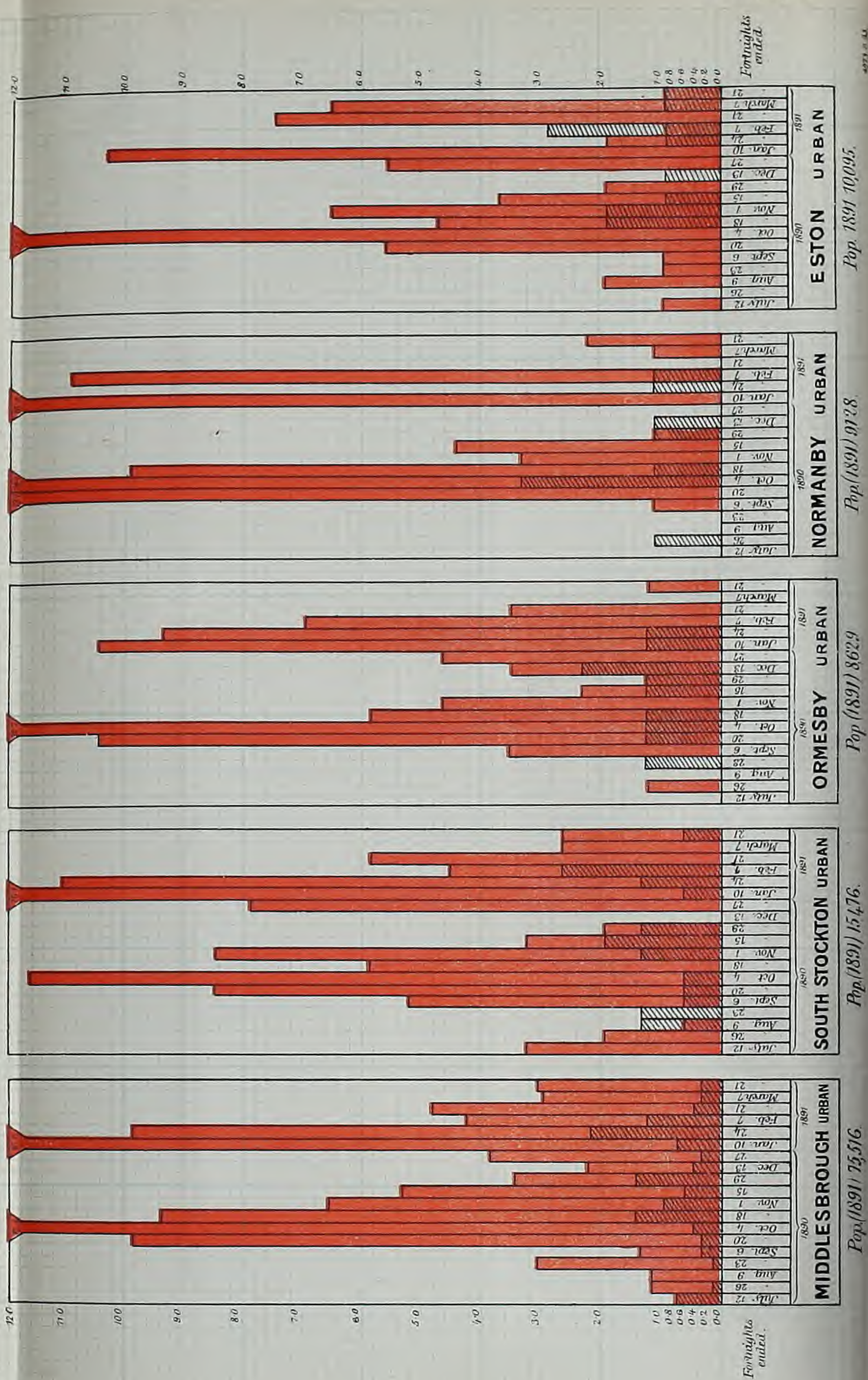


DIAGRAM III. (CONTINUED)

ENTERIC FEVER
Attack & Death Rates
fortnight by fortnight
per 10,000 population

ENTERIC FEVER
Attack & Death Rates
fortnight by fortnight
per 10,000 population

Showing fortnightly by fortnight for each of the Thirty-two Sanitary Districts within the area of the Tees Inquiry the Attack Rate (red) & the Death Rate (shaded) from Enteric Fever per 10,000 of the population enumerated in 1891 during the 19 fortnights ended 21st March, 1891.



Pop. 1891 10,095.

Pop. 1891 8,629.

Pop. 1891 15,476.

Pop. 1891 75,516.

Pop. 1891 9,128.

Pop. 1891 10,095.

DIAGRAM III. (CONTINUED)

light for each of the Thirty-two Sanitary Districts within the area of the Tees Inquiring the Attack Rate (red) & the Death Rate (black) for Enteric Fever per 10,000 of the population enumerated in 1891, during the 19 fortnights ended 21st March 1891.

ENTERIC FEVER
Attack & Death Rates
fortnightly by fortnight
per 10,000 population.

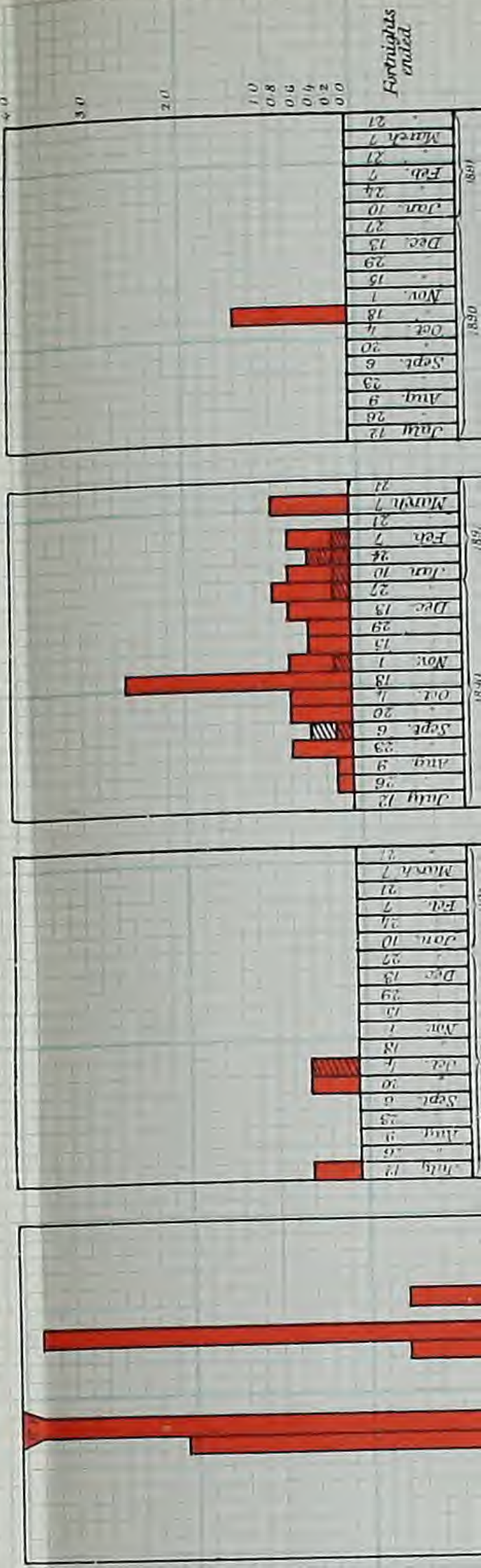


DIAGRAM III. (CONTINUED.)

Enteric Fever
Attack & Death
fortnightly by fort-
per 10,000 popula-

Enteric Fever
Attack & Death rates
for fortnight by fortnight
per 10,000 population

Showing fortnight by fortnight for each of the Thirty two Sanitary Districts within the Area of Attack & Death rates
for fortnight by fortnight
per 10,000 population

Tees Inquiry, the Attack rate (red) and the Death rate (shaded) From Enteric Fever
for fortnight by fortnight
per 10,000 population

1891, during the 19 Fortnights ended 21st March 1891.

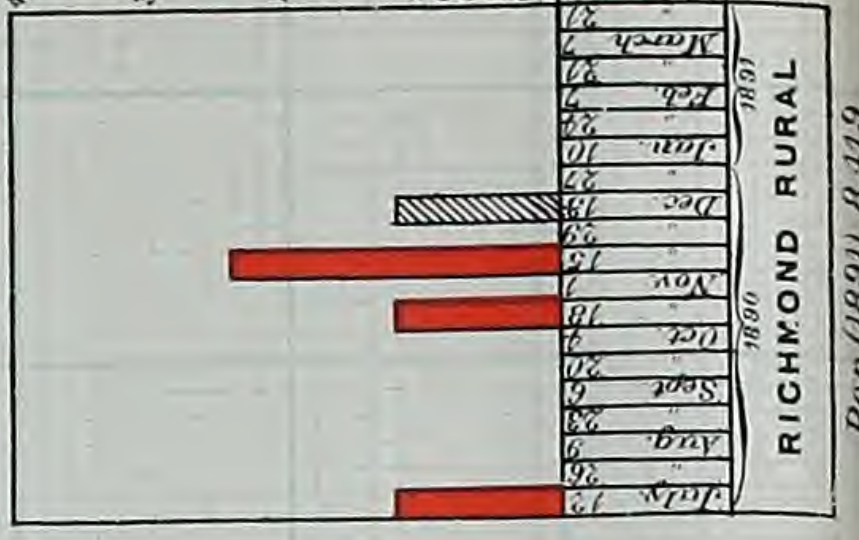
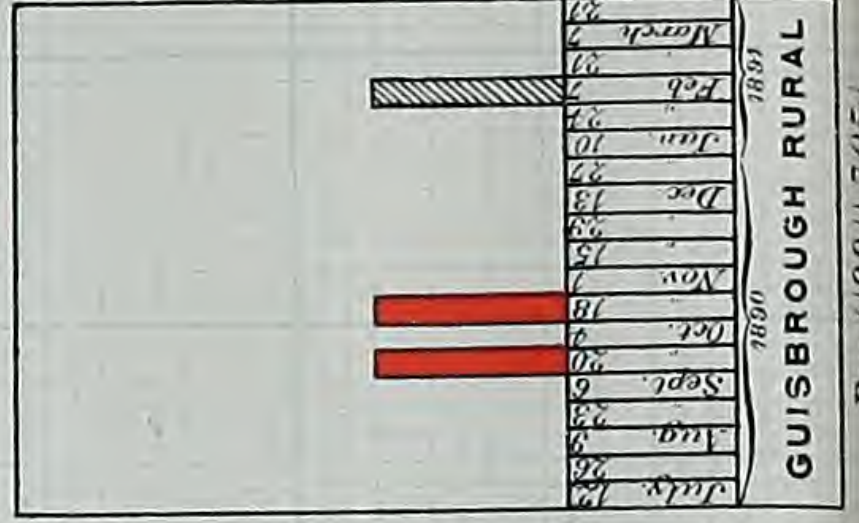
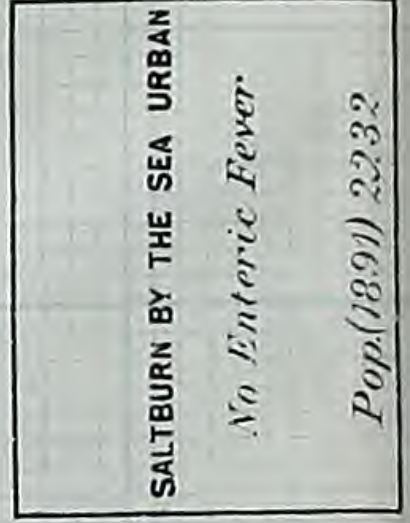
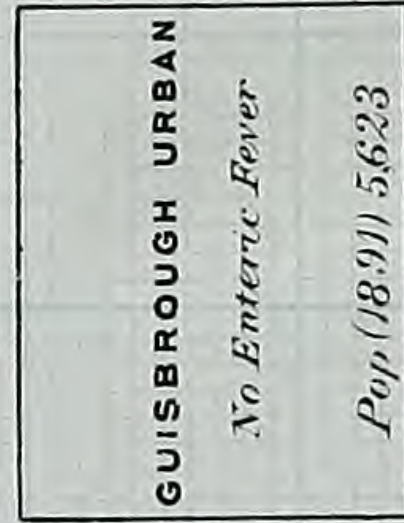
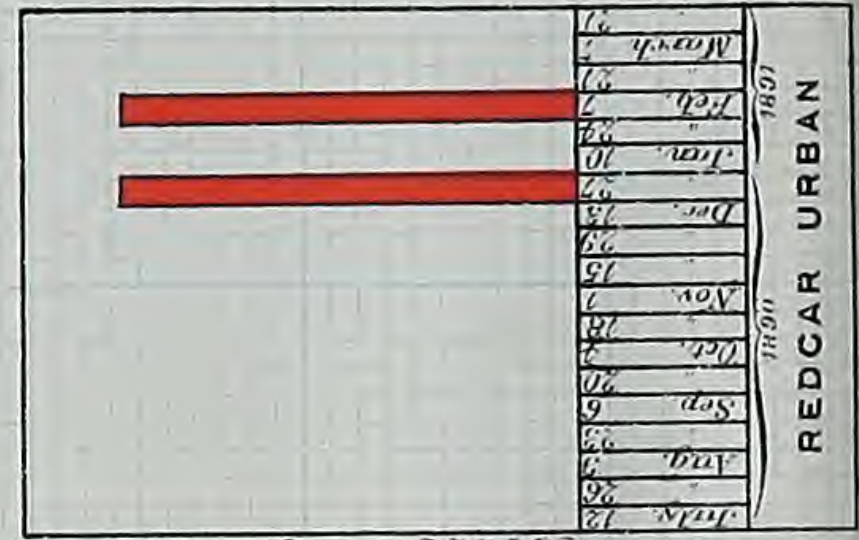
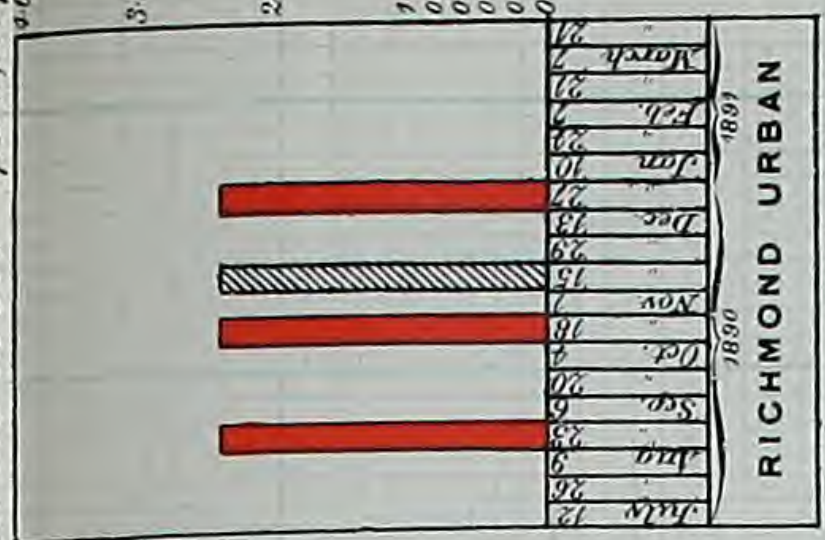
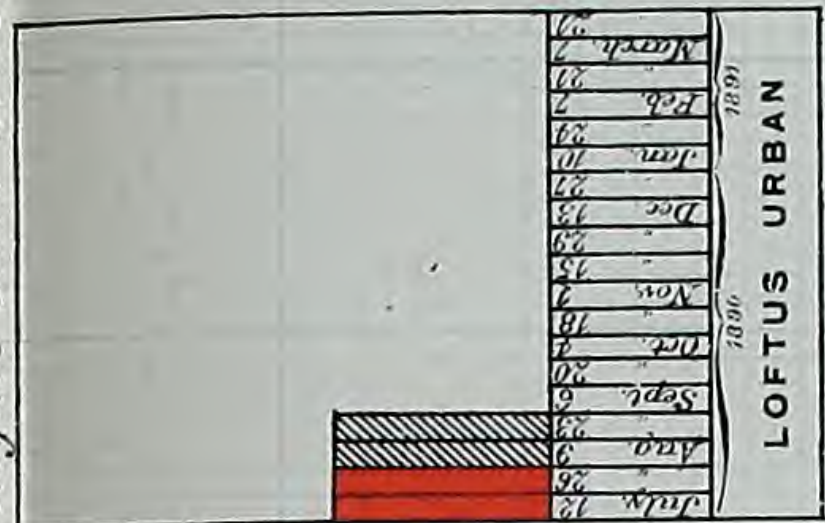
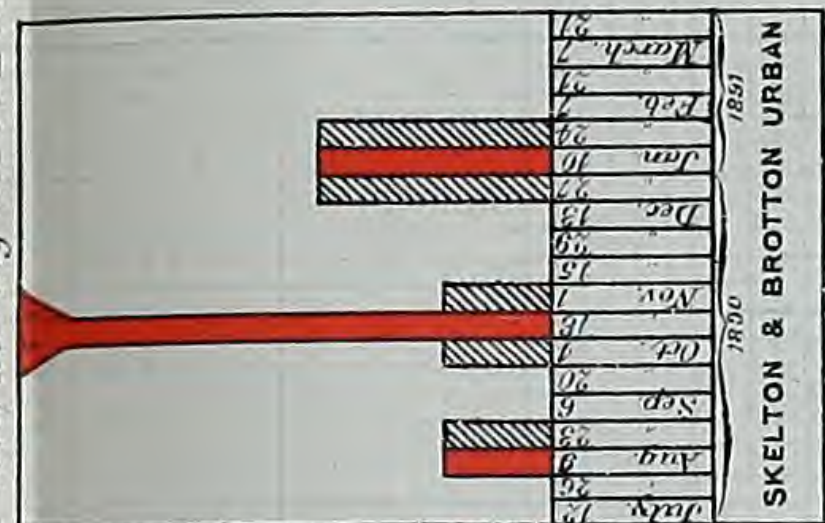
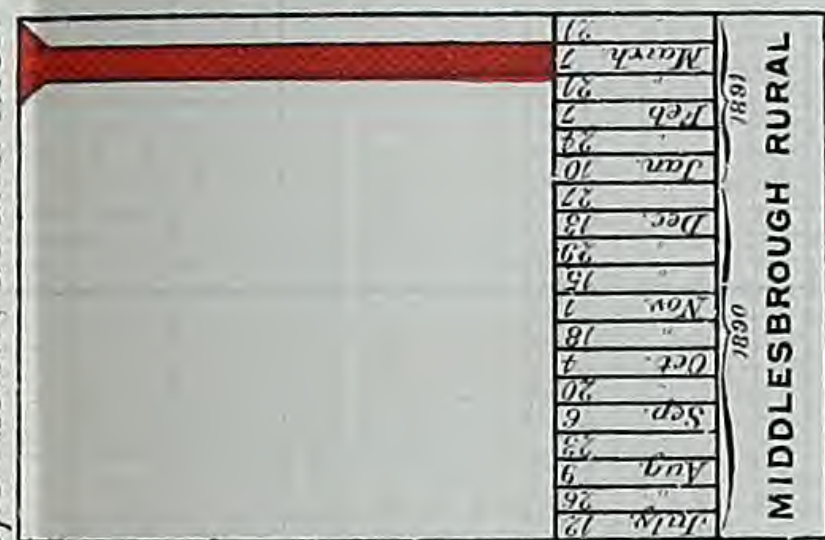
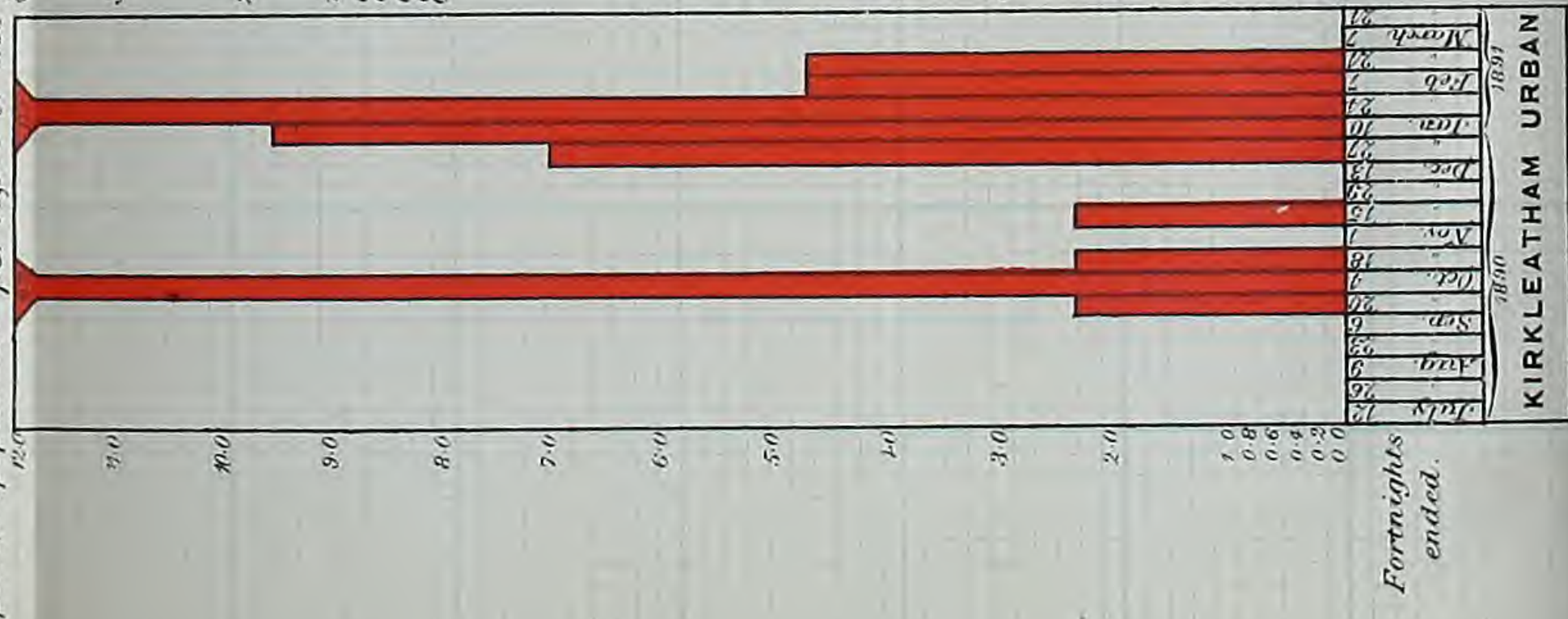
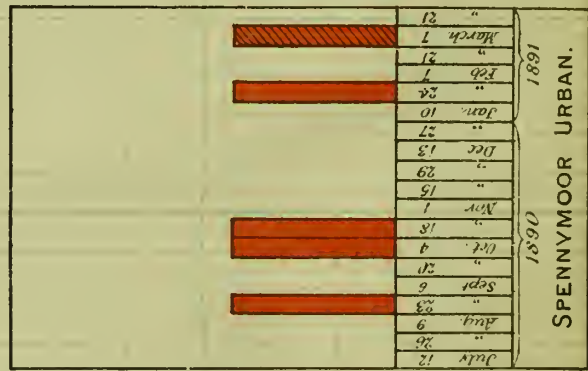
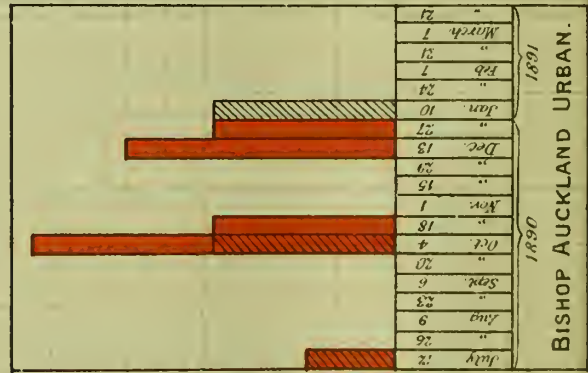
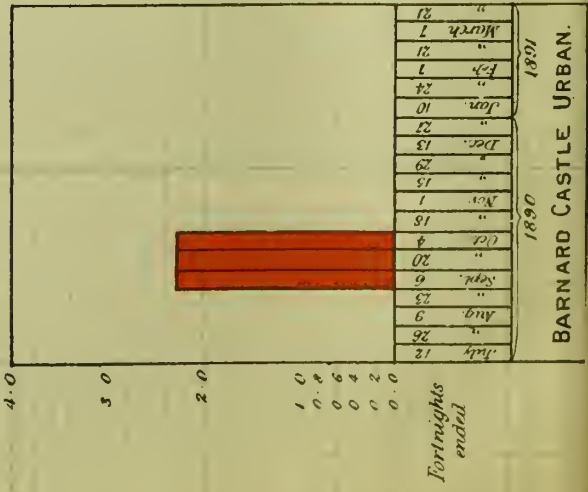
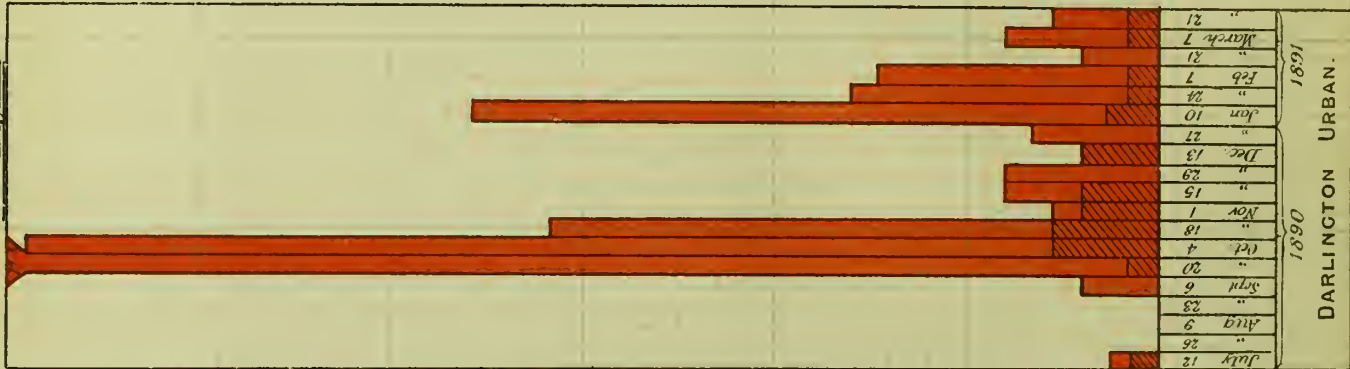
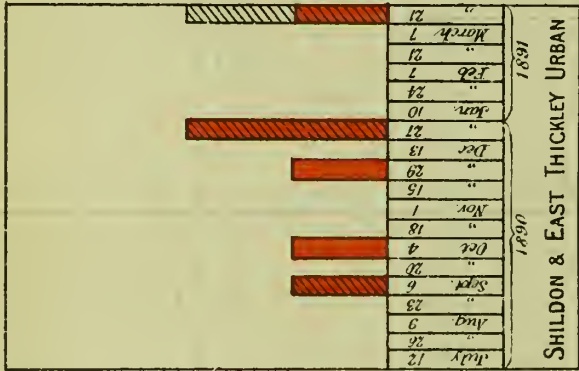
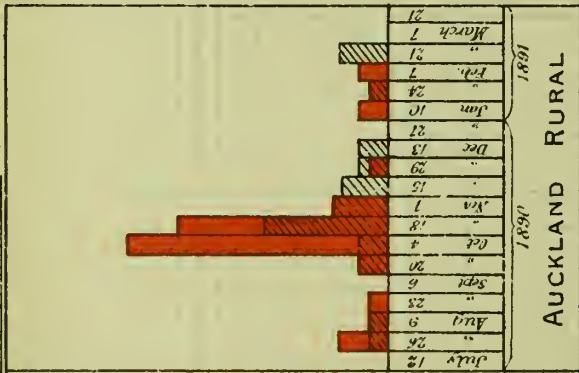
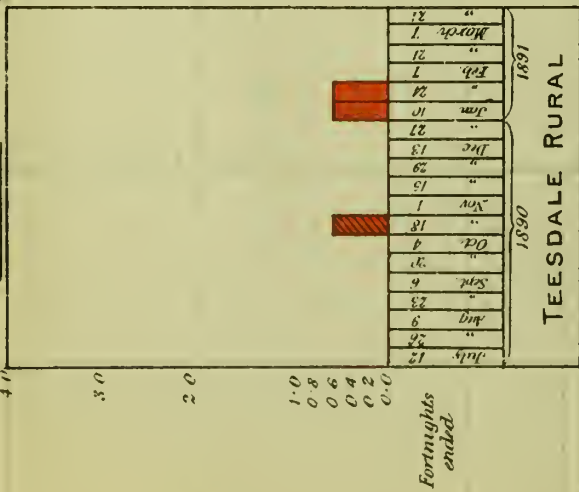




DIAGRAM III.

Showing fortnight fortnight for each of the Thirty-two Sanitary Districts within the area of the Tees Inquiry, the attack rate (red) and the death rate (shaded) from Enteric Fever per 10,000 of the population, enumerated in 1891, during the 19 fortnights ended 21st March 1891.

Enteric Fever
Attack & Death
Rates fortnight by
fortnight per 10,000
Population



Upon examining these tables it will be found that by the sub-division of the Registration Districts into their constituent Sanitary Districts some notable differences in the localisation of Enteric Fever incidence become apparent. Thus, although eleven Sanitary Districts are comprised within the three Registration Districts of Darlington, Stockton, and Middlesbrough, already referred to in this Report as showing an exceptionally heavy incidence of Enteric Fever, this exceptionally heavy incidence affected nine only of the eleven districts, namely, the seven Urban Districts of Darlington, Stockton-on-Tees, Middlesbrough, South Stockton, Ormesby, Normanby, and Eston, and the two Rural Districts of Darlington and Stockton. In the two Rural Districts of Sedgfield and Middlesbrough no such exceptional incidence was observed. On the other hand, this sub-division brings to light the fact that an excessive incidence of Enteric Fever attack took place on the Kirkleatham Urban Sanitary District a district situate in a fourth (Guisbrough) Registration District, wherein, as we have already seen, no special excess of incidence was manifest on the Registration District taken as such.

It thus appears that 10 out of 32 Sanitary Districts show an excessive attack rate from Enteric Fever during the period under review. Dealing with the figures as to Sanitary Districts in similar fashion to that employed in the case of the figures with respect to Registration Districts, it appears that of 2,769 cases of Enteric Fever reported as having occurred during the 32 fortnights ended March 21st, 1891, in the 32 Sanitary Districts, no less than 2,479, or 89·5 per cent., occurred in 10 of these districts, namely, Darlington, U., Darlington, R., Stockton-on-Tees, U., Stockton, R., Middlesbrough, U., South Stockton, U., Ormesby, U., Normanby, U., Eston, U., Kirkleatham, U.

Further, that of the 1,463 cases which occurred during the two epidemic periods (September 7th to October 18th, 1890, and December 28th, 1890, to February 7th, 1891) no less than 1,352, or 92 per cent., occurred in the 10 Sanitary Districts already referred to.

Upon consideration of the attacks in the Sanitary Districts rateably to population, as summarised in Table IX., it appears that in the whole period of 16 months the rate, *collectively and severally*, of Enteric Fever attack in the 10 Sanitary Districts already referred to greatly exceeded that of the other 22 Sanitary Districts; that this excess of incidence was considerably greater in the two six-week-periods, taken together, than in the whole 16 months, and that it was most conspicuous of all in the second six-week-period, namely, that from 28th December 1890 to 7th February 1891.

Further, it will be observed that the differences between the rates, collective and several, of attack in the case of the two groups of Sanitary Districts dealt with in Table IX. were still more marked than were the differences observed between the two groups of Registration Districts dealt with in Table III.

The different behaviour of Enteric Fever in the 32 Sanitary Districts during the 9½ months ended 21st March 1891 is further illustrated, fortnight by fortnight, by the annexed Diagram III. In this diagram the simultaneous excessive incidence of Enteric Fever attack in the 10 Sanitary Districts during each of the two six-week-periods is very apparent.

As regards the remaining 22 Sanitary Districts, it will only be necessary to refer to an increase in the number of cases which occurred during the first six-week-period (7th September to 18th October 1890) in the Auckland Rural Sanitary District. Here the increase referred to was due to a severe outbreak of Enteric Fever at Crook, a village situate on the northern limits of the Wear Valley, fully 16 miles in a direct line from the nearest place in the Tees Valley suffering from exceptional prevalence of Enteric Fever; further, it is to be observed that the first cases at Crook occurred during the fortnight ended October 4th, 1890, or nearly three weeks later than the date of the earlier cases which occurred in the districts in the Tees Valley.

In Table X. the facts with respect to Enteric Fever mortality in each of the 32 Sanitary Districts during the 26 fortnights ended 27th June 1891 are set out in detail. This table, of mortality by Sanitary Districts corresponds with Table IV., where the deaths are distributed according to the Registration Districts in which they occurred.

TABLE X.

SHOWING, for each of the THIRTY-TWO SANITARY DISTRICTS within the AREA of the TEES INQUIRY, the DEATHS REGISTERED from ENTERIC FEVER during the FIFTY-TWO WEEKS ended 27TH JUNE 1891, with the ANNUAL RATE OF MORTALITY from ENTERIC FEVER per 10,000 of the Population enumerated in 1891.

Registration District.	Sanitary District.	Popu- lation, Census 1891.	Deaths from Enteric Fever registered during the fortnight ended														Total Deaths from Enteric Fever registered during the 52 Weeks ended 27 June 1891.	Annual Death-rate from Enteric Fever during 52 Weeks ended 27 June 1891 per 10,000 of the Population enumerated in 1891.												
			1890.								1891.																			
			12 July.	26 July.	9 August.	23 August.	6 September.	20 September.	4 October.	18 October.	1 November.	13 November.	23 November.	13 December.	27 December.	10 January.			24 January.	7 February.	21 February.	7 March.	21 March.	4 April.	18 April.	2 May.	16 May.	30 May.	13 June.	27 June.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.
Teesdale	Teesdale, R. Barnard Castle, U.	16,622 4,341	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.60 0.00
Auckland	Auckland, R. Bishop Auckland, U. Shildon and East Thirkley, U. Spennymoor, U.	62,893 10,527 9,537 6,041	-	1	1	-	-	2	2	8	4	3	2	2	-	2	1	-	3	-	2	1	-	-	1	-	-	-	31	4.93 4.76 8.40 1.66
Darlington	Darlington, U. Darlington, R.	38,060 11,452	1	-	-	-	-	1	4	4	3	3	-	3	-	2	1	1	-	1	1	3	-	-	-	-	-	-	28	7.36 5.24
Stockton	Stockton-on-Tees, U. Stockton, R. Sedgefield, R.	49,731 11,961 19,559	1	-	1	-	-	-	4	2	3	7	3	3	1	7	13	7	2	2	4	1	1	3	-	-	-	-	67	13.48 13.38 1.02
Hartlepool	Hartlepool, U. West Hartlepool, U. Hartlepool, R.	21,521 42,492 2,654	3	-	3	1	1	-	4	1	1	-	-	-	-	1	2	1	-	-	-	1	-	1	-	-	-	-	15	6.97 2.12 0.00
Northallerton	Northallerton, U. Northallerton, R.	3,802 7,490	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2.63 0.00
Stokesley	Stokesley, R.	11,119	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	0.90
Middlesbrough	Middlesbrough, U. South Stockton, U. Ormesby, U. Normanby, U. Eston, U. Middlesbrough, R.	75,516 15,476 8,029 9,128 10,665 1,760	5	1	2	1	2	2	3	10	7	4	10	3	2	5	16	9	3	2	2	2	1	1	1	1	2	1	95	12.59 16.15 25 13.90 12 9.87 12.00 5.5
Guisborough	Kirkcubbin, U. Redcar, U. Guisborough, U. Skelton and Brotton, U. Saltburn-by-the-Sea, U. Loftus, U. Guisborough, R.	4,260 2,818 5,623 11,842 2,232 6,298 7,054	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00 0.00 0.00 6.75 0.00 3.22 1.42
Richmond	Richmond, U. Richmond, R.	4,216 8,419	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	2.37 1.19
Totals	32	503,616	11	3	8	10	7	9	30	30	25	24	21	18	8	19	41	31	8	9	11	10	7	7	2	3	4	2	358	7.12

The facts as to Enteric Fever mortality in the several Sanitary Districts in Table X. have been summarised in the following Table XI. rateably to population, in the same manner that the facts with respect to Enteric Fever mortality in Registration Districts contained in Table IV. were summarised in Table V.

TABLE XI.

The Thirty-two Sanitary Districts comprised within the Ten Registration Districts selected for Inquiry.		DEATHS per 10,000 Population in each instance.			
		13 Months to 27 June 1891.	7 Months to 21 March 1891.	3½ Months to 13 Dec. 1890.	3¼ Months to 21 March 1891.
TEN SANITARY DISTRICTS.	DARLINGTON, U. -	7·4	6·3	4·7	1·6
	DARLINGTON, R. - -	5·2	5·2	2·6	2·6
	STOCKTON-ON-TEES, U. -	13·5	11·7	4·4	7·3
	STOCKTON, R. - -	13·4	10·0	7·5	2·5
	MIDDLESBROUGH, U. -	12·6	10·4	5·2	5·2
	SOUTH STOCKTON, U. -	16·2	11·0	5·8	5·2
	ORMESBY, U. - -	13·9	10·4	8·1	2·3
	NORMANBY, U. - -	9·9	8·8	6·6	2·2
	ESTON, U. - - -	11·9	11·9	5·9	5·9
	KIRKLEATHAM, U. -	0·0	0·0	0·0	0·0
OTHER TWENTY-TWO SANITARY DISTRICTS.	Teesdale, R. - -	0·6	0·6	0·6	0·0
	Barnard Castle, U. -	0·0	0·0	0·0	0·0
	Auckland, R. - -	4·9	4·3	3·7	0·6
	Bishop Auckland, U. -	4·8	3·8	1·9	1·9
	Shildon and East Thickley, U.	8·4	4·2	4·2	0·0
	Spennymoor, U. - -	1·7	1·7	0·0	1·7
	Sedgefield, R. - -	1·0	0·5	0·5	0·0
	Hartlepool, U. - -	7·0	2·3	2·3	0·0
	West Hartlepool, U. -	2·1	1·4	0·2	1·2
	Hartlepool, R. - -	0·0	0·0	0·0	0·0
	Northallerton, U. -	2·6	0·0	0·0	0·0
	Northallerton, R. -	0·0	0·0	0·0	0·0
	Stokesley, R. - -	0·9	0·9	0·9	0·0
	Middlesbrough, R. -	5·6	5·6	0·0	5·6
	Redcar, U. - -	0·0	0·0	0·0	0·0
	Guisbrough, U. -	0·0	0·0	0·0	0·0
	Skelton and Brotton, U.	6·8	5·1	3·4	1·7
	Saltburn-by-the-Sea, U.	0·0	0·0	0·0	0·0
	Loftus, U. - - -	3·2	0·0	0·0	0·0
	Guisbrough, R. - -	1·4	1·4	0·0	1·4
	Richmond, U. - -	2·4	2·4	2·4	0·0
	Richmond, R. - -	1·2	1·2	1·2	0·0

Sanitary
Districts.
Mortality.

From this table it will be seen that during the period of seven months ended 21st March 1891, and during each of the two periods of $3\frac{1}{2}$ months ended 13th December 1890, and 21st March 1891 respectively, the incidence of Enteric Fever mortality was, collectively and almost district by district, in large excess in the 10 Sanitary Districts (with the single exception of Kirkleatham, where no fatal case occurred) as compared with the remaining 22 Sanitary Districts, comprised within the area of inquiry.

The different incidence in *amount* of Enteric Fever mortality in each of the 32 Sanitary Districts during the 13 months ended 27th June 1891, is further illustrated in Diagram IV. annexed.

The different incidence of Enteric Fever mortality in point of *time*, fortnight by fortnight, in each of the 32 Sanitary Districts, during the $9\frac{1}{2}$ months ended 21st March 1891, has been already illustrated by the shaded portion of Diagram III.

Summary.

Comparison, then, of Diagrams III. and IV., of the facts of Tables VII. and X. and of the data adduced therefrom, suffices to indicate that during two six-week-periods ended 18th October 1890, and 7th February 1891, the rate, collectively and severally, of Enteric Fever *attack* in the Urban Sanitary Districts of Darlington, Stockton-on-Tees, Middlesbrough, South Stockton, Ormesby, Normanby, Eston, and Kirkleatham, and in the Rural Sanitary Districts of Darlington and Stockton enormously exceeded that of the other 22 Sanitary Districts comprised within the area of inquiry; and that in like manner the rate of *death* from Enteric Fever in the same 10 Sanitary Districts (with the single exception of Kirkleatham) was, during two periods each of $3\frac{1}{2}$ months ended 13th December 1890 and 21st March 1891 respectively, also almost without exception much in excess of that of the other 22 Sanitary Districts; and that both as regards Enteric Fever *attacks* and Enteric Fever *deaths*, the excess was most conspicuous in the later period, a period when Enteric Fever, as already stated, is—unless very special conditions favour its dissemination—unapt to become epidemic in this country.

Distribution
of Enteric
Fever in
certain Towns.

Before considering circumstances possessed in common by these ten Sanitary Districts, likely to favour sudden and extensive dissemination in them of Enteric Fever, it will be useful to ascertain to what extent its excessive prevalence in the large towns of Darlington, Stockton, and Middlesbrough, was common to the whole area of those towns, or was limited to any special part of them; and also, as regards the Rural Sanitary Districts of Darlington and Stockton, how far the incidence was confined to particular villages to the exclusion of others.

For municipal purposes the towns of Darlington, Stockton, and Middlesbrough are divided into 6, 10, and 5 wards respectively, and these wards form convenient areas for ascertaining the range and limitations of the epidemic prevalence of Enteric Fever in the towns in question. I have, therefore, in Tables XII., XIII., and XIV., distributed for Darlington, Stockton-on-Tees, and Middlesbrough, respectively, according to their several wards, and for each of the 15 fortnights ended 21st March 1891, (a) the houses invaded by Enteric Fever, and (b) the persons attacked by Enteric Fever.

DIAGRAM IV

Shewing for each of the Thirty-two Sanitary Districts within the area of the Tees Inquiry, the Death rate from Enteric Fever, per 10,000 population enumerated in 1891, during the 52 weeks ended 27th June 1891.

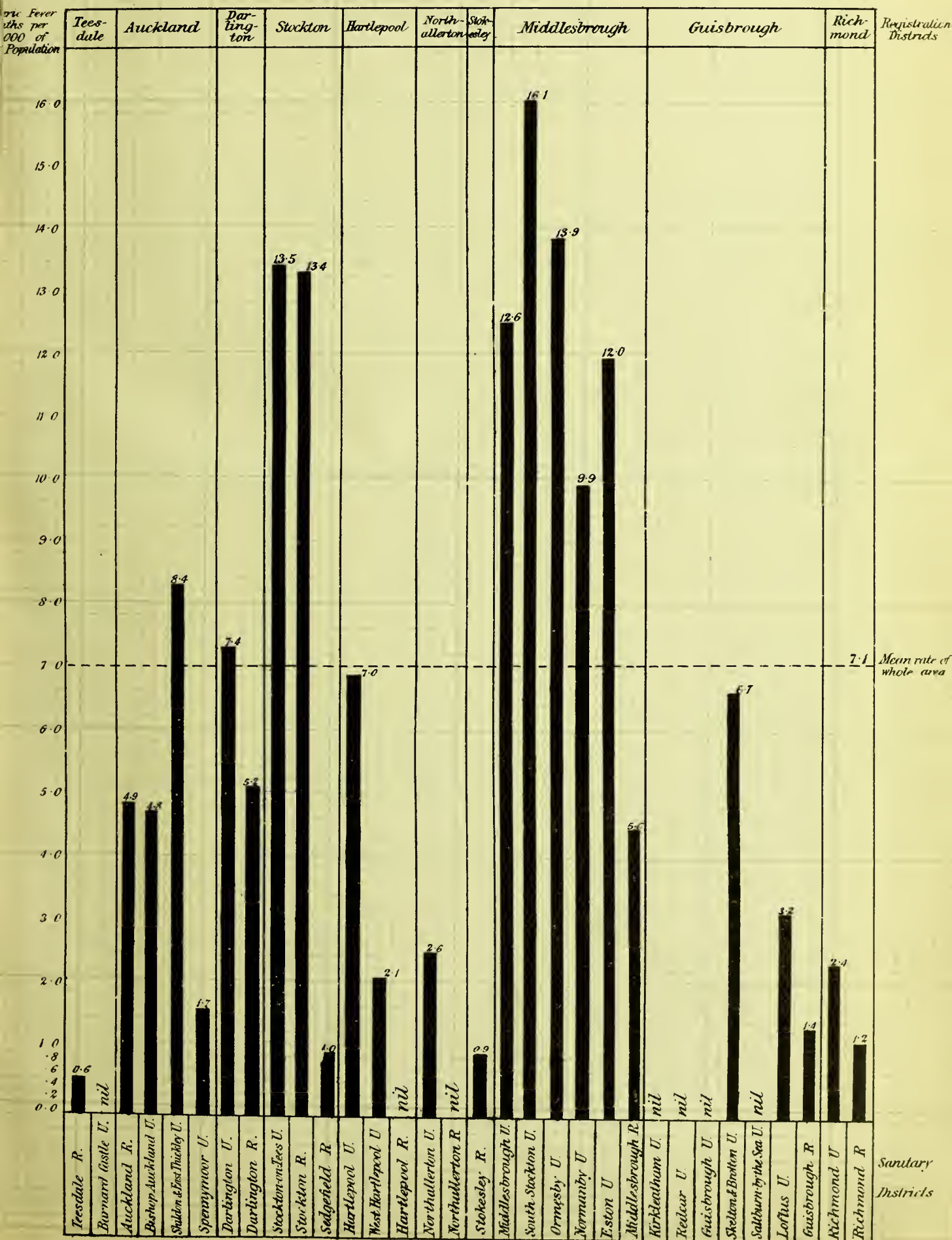




TABLE XII.

SHOWING, for the BOROUGH OF DARLINGTON, (a) HOUSES invaded and (b) PERSONS attacked by ENTERIC FEVER, Fortnight by Fortnight, in the several WARDS during the 30 Weeks ended 21st MARCH 1891.

*Distribution of
Enteric Fever
in
certain Towns.
—
Darlington.*

(a) Houses invaded by Enteric Fever.

Wards.	Inhabited Houses, 1891.	Houses invaded by Enteric Fever during Fortnights ended															Houses invaded during			
		1890.										1891.					15 Fortnights ended 21 March 1891.	6 Weeks ended 18 October 1890.	6 Weeks ended 7 February 1891.	2 Periods of 6 Weeks collectively.
		6 September.	20 September.	4 October.	18 October.	1 November.	15 November.	29 November.	13 December.	27 December.	10 January.	24 January.	7 February.	21 February.	7 March.	21 March.				
		3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.				
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.
North - - -	1,891	-	6	8	2	1	-	1	-	-	2	2	-	-	-	1	23	16	4	20
North-West - -	843	-	6	6	1	1	-	2	-	-	2	-	1	-	-	1	20	13	3	16
South - - -	1,040	1	8	4	1	1	1	1	-	-	4	1	2	1	3	-	28	13	7	20
East - - -	1,314	2	10	15	5	-	2	-	2	1	8	2	1	1	1	2	52	30	11	41
West - - -	1,055	-	9	7	5	-	1	-	-	2	3	1	2	1	-	-	31	21	6	27
Central - - -	1,072	-	12	3	3	1	-	-	1	2	7	5	1	-	-	-	35	18	13	31
Borough of Darlington	7,215	3	51	43	17	4	4	4	3	5	26	11	7	3	4	4	189	111	44	155

(b) Persons attacked by Enteric Fever.

Wards.	Population, 1891.	New Cases of Enteric Fever reported during Fortnights ended															Persons attacked by Enteric Fever during			
		1890.										1891.					15 Fortnights ended 21 March 1891.	6 Weeks ended 18 October 1890.	6 Weeks ended 7 February 1891.	2 Periods of 6 Weeks collectively.
		6 September.	20 September.	4 October.	18 October.	1 November.	15 November.	29 November.	13 December.	27 December.	10 January.	24 January.	7 February.	21 February.	7 March.	21 March.				
		3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.				
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.
North - - -	9,825	-	6	8	2	1	-	1	-	-	2	2	-	-	-	1	23	16	4	20
North West - -	4,222	-	6	6	1	1	-	3	-	-	2	-	1	-	1	1	22	13	3	16
South - - -	5,602	1	8	4	2	1	1	1	-	-	4	1	3	1	3	-	30	14	8	22
East - - -	6,660	2	13	16	11	-	2	-	2	1	8	2	2	1	1	2	63	40	12	52
West - - -	5,584	-	10	8	5	-	3	1	1	2	4	2	2	1	-	-	39	23	8	31
Central - - -	6,167	-	12	3	3	1	-	-	-	2	7	5	3	-	1	-	37	18	15	33
Borough of Darlington	38,060	3	55	45	24	4	6	6	3	5	27	12	11	3	6	4	214	124	50	174

ENTERIC
FEVER IN THE
TEES VALLEY,
1890-91; BY
DR. BARRY.

Distribution of
Enteric Fever
in
certain Towns.

Stockton-on-
Tees.

TABLE XIII.

SHOWING, for the BOROUGH of STOCKTON-ON-TEES, (a) HOUSES invaded and (b) PERSONS attacked by ENTERIC FEVER, Fortnight by Fortnight, in the several WARDS, during the 30 Weeks ended 21st MARCH 1891.

(a) Houses invaded by Enteric Fever.

Wards.	Inhabited Houses, 1891.	Houses invaded by Enteric Fever during Fortnights ended															Houses invaded during			
		1890.										1891.					15 Fortnights ended 21 March 1891.	6 Weeks ended 18 October 1890.	6 Weeks ended 7 February 1891.	2 Periods of 6 Weeks collectively.
		6 September.	20 September.	4 October.	18 October.	1 November.	15 November.	29 November.	13 December.	27 December.	10 January.	24 January.	7 February.	21 February.	7 March.	21 March.				
		3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.				
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.
Parkfield - -	718	1	9	5	3	-	1	-	-	2	5	3	3	-	2	2	36	17	11	28
South-West - -	927	-	4	3	4	-	-	-	1	-	4	6	6	2	-	2	32	11	16	27
West End - -	967	3	8	9	7	3	1	1	5	2	13	4	4	1	-	2	63	24	21	45
Exchange - -	778	1	3	7	4	2	-	7	1	1	4	4	3	1	1	1	40	14	11	25
Central - -	1,108	2	1	4	4	1	-	-	-	1	18	2	3	1	1	2	40	9	23	32
North-West - -	801	1	9	4	5	4	4	-	-	2	3	5	3	1	-	-	41	18	11	29
Tilery - -	782	1	3	9	4	2	3	2	-	-	8	6	3	2	2	-	45	16	17	32
Victoria - -	1,088	-	3	7	11	4	2	2	1	2	8	8	4	2	2	-	56	21	20	41
Portrack - -	713	1	2	6	4	1	1	-	1	-	9	3	5	4	1	-	38	12	17	29
South-East - -	883	1	4	4	7	5	2	-	-	3	7	1	2	-	-	-	36	15	10	25
Borough of Stockton-on-Tees - - }	8,765	11	46	58	53	22	14	12	9	13	79	42	36	14	9	9	427	157	157	314

(b) Persons attacked by Enteric Fever.

Wards.	Population, 1891.	New Cases of Enteric Fever reported during the Fortnights ended															Persons attacked by Enteric Fever during			
		1890.										1891.					15 Fortnights ended 21 March 1891.	6 Weeks ended 18 October 1890.	6 Weeks ended 7 February 1891.	2 Periods of 6 Weeks collectively.
		6 September.	20 September.	4 October.	18 October.	1 November.	15 November.	29 November.	13 December.	27 December.	10 January.	24 January.	7 February.	21 February.	7 March.	21 March.				
		3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.				
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.
Parkfield - -	4,022	1	9	5	5	2	1	1	1	3	5	3	3	-	2	2	43	19	11	30
South-West - -	4,997	-	4	3	4	-	-	-	1	-	4	7	7	2	-	2	34	11	18	29
West End - -	5,406	4	9	9	7	3	1	2	5	2	14	4	4	1	-	2	67	25	22	47
Exchange - -	4,180	1	3	7	5	3	-	9	1	1	6	4	4	1	1	1	47	15	14	29
Central - -	5,897	2	2	6	4	1	-	-	-	1	17	3	3	1	3	4	47	12	23	35
North-West - -	4,480	1	9	4	5	7	5	-	-	3	4	6	6	1	-	-	51	18	16	34
Tilery - -	4,313	1	3	10	4	4	3	2	-	-	9	9	5	3	2	-	55	17	23	40
Victoria - -	6,055	-	3	7	11	4	2	2	2	2	11	10	5	5	2	-	66	21	26	47
Portrack - -	4,625	1	2	6	5	1	2	1	1	-	9	3	5	5	3	-	44	13	17	30
South East - -	5,730	1	6	5	7	6	2	-	-	3	7	1	4	-	-	-	42	18	12	30
Borough of Stockton-on-Tees - - }	49,705	12	50	62	57	31	16	17	11	15	86	50	46	19	13	11	496	169	182	351

TABLE XIV.

SHOWING, for the BOROUGH of MIDDLESBROUGH, (a) HOUSES invaded, and (b) PERSONS attacked by ENTERIC FEVER, Fortnight by Fortnight, in the several WARDS, during the 30 Weeks ended 21st MARCH 1891.

(a) Houses invaded by Enteric Fever.

Wards.	Inhabited Houses, 1891.	Houses invaded by Enteric Fever during Fortnights ended															Houses invaded during			
		1890.										1891.					15 Fortnights ended 21 March 1891.	18 Weeks ended 18 October 1890.	7 Weeks ended 7 February 1891.	2 Periods of 6 Weeks collectively.
		6 September.	20 September.	4 October.	18 October.	1 November.	15 November.	29 November.	13 December.	27 December.	10 January.	24 January.	7 February.	21 February.	7 March.	21 March.				
		3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.				
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.
South - -	1,618	3	4	5	9	7	3	2	-	4	29	11	6	2	3	4	92	18	46	64
West - - -	2,709	2	16	19	7	11	5	3	-	1	18	5	4	3	3	1	98	42	27	69
Middle - -	3,083	-	17	19	14	5	4	1	3	10	21	16	4	7	2	1	124	50	41	91
North-East - -	1,991	1	13	8	2	6	7	5	3	7	20	11	3	6	4	2	98	23	34	57
North-West - -	3,907	4	22	37	33	15	10	10	7	3	26	20	9	9	6	10	221	92	55	147
Borough of Middles- brough - - }	13,307	10	72	88	65	44	29	21	13	25	114	63	26	27	18	18	633	225	203	428

(b) Persons attacked by Enteric Fever.

Wards.	Population, 1891.	New Cases of Enteric Fever reported during the Fortnights ended															Persons attacked by Enteric Fever during			
		1890.										1891.					15 Fortnights ended 21 March 1891.	18 Weeks Period ended 18 October 1890.	7 Weeks Period ended 7 February 1891.	2 Periods of 6 Weeks collectively.
		6 September.	20 September.	4 October.	18 October.	1 November.	15 November.	29 November.	13 December.	27 December.	10 January.	24 January.	7 February.	21 February.	7 March.	21 March.				
		3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.				
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.
South - -	9,587	3	4	5	10	7	4	2	-	6	25	14	8	4	4	4	100	19	47	66
West - - -	14,649	2	17	21	7	11	6	3	1	2	24	5	7	3	3	1	113	45	36	81
Middle - -	16,702	-	17	21	14	5	4	2	3	10	22	18	4	10	2	2	134	53	44	96
North-East - -	12,313	1	13	8	2	7	8	6	4	7	21	11	3	8	4	4	107	23	35	58
North-West - -	22,262	4	23	39	37	19	18	13	9	4	29	26	10	11	9	12	263	99	65	164
Borough of Middles- brough - - }	75,513	10	74	94	70	49	40	26	17	29	121	74	32	36	22	23	717	238	227	465

The facts with respect to *house invasions* during the two six-week-periods (7th September to 18th October 1890, and 28th December 1890 to 7th February 1891) collectively and severally, are summarised in Table XV. rateably to houses enumerated at the Census of 1891; and the facts with respect to *persons attacked* by Enteric Fever, are in like manner summarised for the same period rateably to population in Table XVI.

TABLE XV.

Distribution of
Enteric Fever
in
certain Towns.

The Twenty-one Wards comprised within the Three Boroughs of Darlington, Stockton-on-Tees, and Middlesbrough.				Houses invaded, per cent. of Houses enumerated in each instance.		
				Two Periods, each of Six Weeks collectively.	First Six-Week Period (7 Sept. 1890-18 Oct. 1890).	Second Six-Week Period (28 Dec. 1890-7 Feb. 1891).
BOROUGH OF DARLINGTON.	North - - -	-	-	1·0	0·8	0·2
	North West - -	-	-	1·9	1·5	0·4
	South - - -	-	-	1·9	1·2	0·7
	East - - -	-	-	3·1	2·3	0·8
	West - - -	-	-	2·6	2·0	0·6
	Central - - -	-	-	2·9	1·7	1·2
BOROUGH OF STOCKTON-ON-TEES.	Parkfield - - -	-	-	3·9	2·4	1·5
	South-West - -	-	-	2·9	1·2	1·7
	West End - - -	-	-	4·7	2·5	2·2
	Exchange - - -	-	-	3·2	1·8	1·4
	Central - - -	-	-	2·9	0·8	2·1
	North-West - -	-	-	3·6	2·2	1·4
	Tilery - - -	-	-	4·2	2·0	2·2
	Victoria - - -	-	-	3·7	1·9	1·8
	Portrack - - -	-	-	4·1	1·7	2·4
	South-East - -	-	-	2·9	1·7	1·1
BOROUGH OF MIDDLESBROUGH.	South - - -	-	-	3·9	1·1	2·8
	West - - -	-	-	2·6	1·6	1·0
	Middle - - -	-	-	2·9	1·6	1·3
	North-East - -	-	-	2·9	1·2	1·7
	North-West - -	-	-	3·8	2·4	1·4

TABLE XVI.

The Twenty-one Wards comprised within the Three Boroughs of Darlington, Stockton-on-Tees, and Middlesbrough.				Attacks per 10,000 Population in each instance.		
				Two Periods, each of Six Weeks collectively.	First Six-Week Period (7 Sept. 1890-18 Oct. 1890).	Second Six-Week Period (28 Dec. 1890-7 Feb. 1891).
BOROUGH OF DARLINGTON.	North - - -	-	-	20·4	16·3	4·1
	North-West - -	-	-	37·9	30·8	7·1
	South - - -	-	-	39·3	25·0	14·3
	East - - -	-	-	78·1	60·1	18·0
	West - - -	-	-	55·5	41·2	14·3
	Central - - -	-	-	53·6	29·2	24·4
BOROUGH OF STOCKTON-ON-TEES.	Parkfield - - -	-	-	74·6	47·2	27·4
	South-West - -	-	-	58·1	22·0	36·1
	West End - - -	-	-	87·1	46·3	40·8
	Exchange - - -	-	-	69·3	35·9	33·4
	Central - - -	-	-	59·4	20·4	39·0
	North-West - -	-	-	75·8	40·1	35·7
	Tilery - - -	-	-	92·7	39·4	53·3
	Victoria - - -	-	-	77·7	34·7	43·0
	Portrack - - -	-	-	64·8	28·1	36·7
	South-East - -	-	-	52·4	31·4	21·0
BOROUGH OF MIDDLESBROUGH.	South - - -	-	-	68·9	19·8	49·1
	West - - -	-	-	55·2	30·7	24·5
	Middle - - -	-	-	57·5	31·1	26·4
	North-East - -	-	-	47·1	18·7	28·4
	North-West - -	-	-	73·7	44·5	29·2

Hence it appears that, notwithstanding the sub-division of the three large towns into 21 wards, having great variation in the number of houses and of inhabitants, the ratios of *houses invaded* and of *persons attacked* in these several wards during the period of three months, and during each of the two periods of six-weeks, were in almost every instance excessive; and this universality of distribution of fever throughout all three Boroughs points very strongly to the operation in them of some common cause of Enteric Fever dissemination.

The distribution of the houses invaded by Enteric Fever in the several wards of Darlington, Stockton-on-Tees, and Middlesbrough, as well as in the Urban Sanitary Districts of South Stockton, and of Ormesby, are shown graphically in the annexed dotted Maps III. to XIV. for each of the fortnights included in the first six-weeks'-period (Sept. 7th to Oct. 18th, 1890), and for the next succeeding fortnight. These maps demonstrate the distribution ward by ward of house invasions in the period throughout the Urban Sanitary Districts in question.



Fortnight ended October 4th 1890.

MAP IV.



Fortnight ended October 18th 1890.



rateable values of the houses contained in the several wards of the town, and the proportion in each instance of houses of each class to total houses.

TABLE XVII.

SHOWING for DARLINGTON the NUMBER and RATEABLE VALUES of DWELLING HOUSES situate in the several WARDS comprised within the BOROUGH.

Wards.	Number of Houses rated at						Total Houses on Rate Books, October 1890.	Percentage of Total Houses rated at					
	Under 5l.	5l. and under 10l.	10l. and under 20l.	20l. and under 30l.	30l. and under 40l.	40l. and up-wards.		Under 5l.	5l. and under 10l.	10l. and under 20l.	20l. and under 30l.	30l. and under 40l.	40l. and up-wards.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
North - - -	437	1,214	176	29	6	3	1,865	23·4	65·1	9·4	1·6	0·3	0·2
North-West - - -	225	365	206	28	13	21	858	26·2	42·6	24·0	3·3	1·5	2·4
South - - -	211	524	209	104	17	56	1,121	18·9	46·7	18·6	9·3	1·5	5·0
East - - -	337	804	209	27	4	5	1,386	24·3	58·0	15·1	1·9	0·3	0·4
West - - -	166	374	362	153	93	120	1,268	13·1	29·5	28·5	12·1	7·3	9·5
Central - - -	368	527	283	83	36	47	1,344	27·4	39·2	21·0	6·2	2·7	3·5
Borough of Darlington -	1,744	3,808	1,445	424	169	252	7,842	22·3	48·6	18·4	5·4	2·1	3·2

From this table it appears that about 70 per cent. of the houses of Darlington have rateable values under 10l., and are consequently of the cottage class; and that this proportion is considerably exceeded in the north and east wards, where dwellings of rateable values under 10l. constitute 88·5 and 82 per cent. respectively. The west ward contains a considerable number of higher-class residences, but this ward, together with the north-west, central, and south wards meet in the centre of the town, and each includes a number of the older houses.

The house accommodation of the poorer classes is generally fair, but in many instances the free ventilation of the houses is indirectly interfered with owing to the occupants being restrained from opening their windows on account of the foul emanations arising from the middens, where such are placed in small back yards. Tenemented houses, or houses in which single rooms are let off as separate dwellings for families, exist in certain parts of the borough, as, for example, in Church Street and Park Street in the south ward, and in Bowes Street and Brunswick Street in the central ward. Some back-to-back houses also exist in these localities. In the central and older part of the town a number of narrow courts exist, to which access is obtained from the front streets by means of covered entrances beneath the upper floors of the houses and the ventilation of the houses in these courts is frequently defective, but the courts themselves are, as a rule, paved and well kept.

The main roadways are macadamized with whinstone, and the subsidiary streets with slag. The back streets at the time of my inspection were, with only one exception, unpaved and unmade, and were frequently in a serious state of neglect, their filthy condition being intensified by the practice of throwing upon them the contents of the privy middens, preparatory to their being carted away.

As regards the prevalence of Enteric Fever in Darlington during the two six-week periods (September 7th—December 1st, 1890, and December 28th, 1890—February 7th, 1891) it has already been noted that the epidemic affected almost indifferently all the wards. And from a comparison of Table XVII. with Tables XV. and XVI. it would appear that the degree of incidence was independent of the character of the house accommodation. Thus, although the largest proportion of cottage houses existed in the north (88·5 per cent.) and east (82 per cent.) wards respectively, the fever incidence was lightest in the former and heaviest in the latter ward; and, further, in the west, or residential ward, it was considerably above the average for the borough.

Fortnight ended October 4th 1890.

MAP IV.



Fortnight ended October 18th 1890.

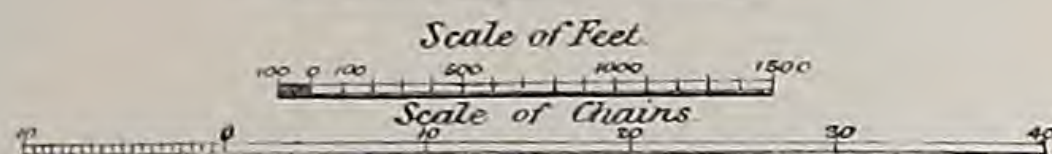
MAP OF
THE BOROUGH OF
DARLINGTON.

Boundaries of Sanitary Districts.

Ward Boundaries.

Houses within the Urban District invaded by Enteric Fever.

Scale 6 Inches to 1 Mile - 10300



DARLINGTON RURAL SANITARY DISTRICT

N O R T H W E S T

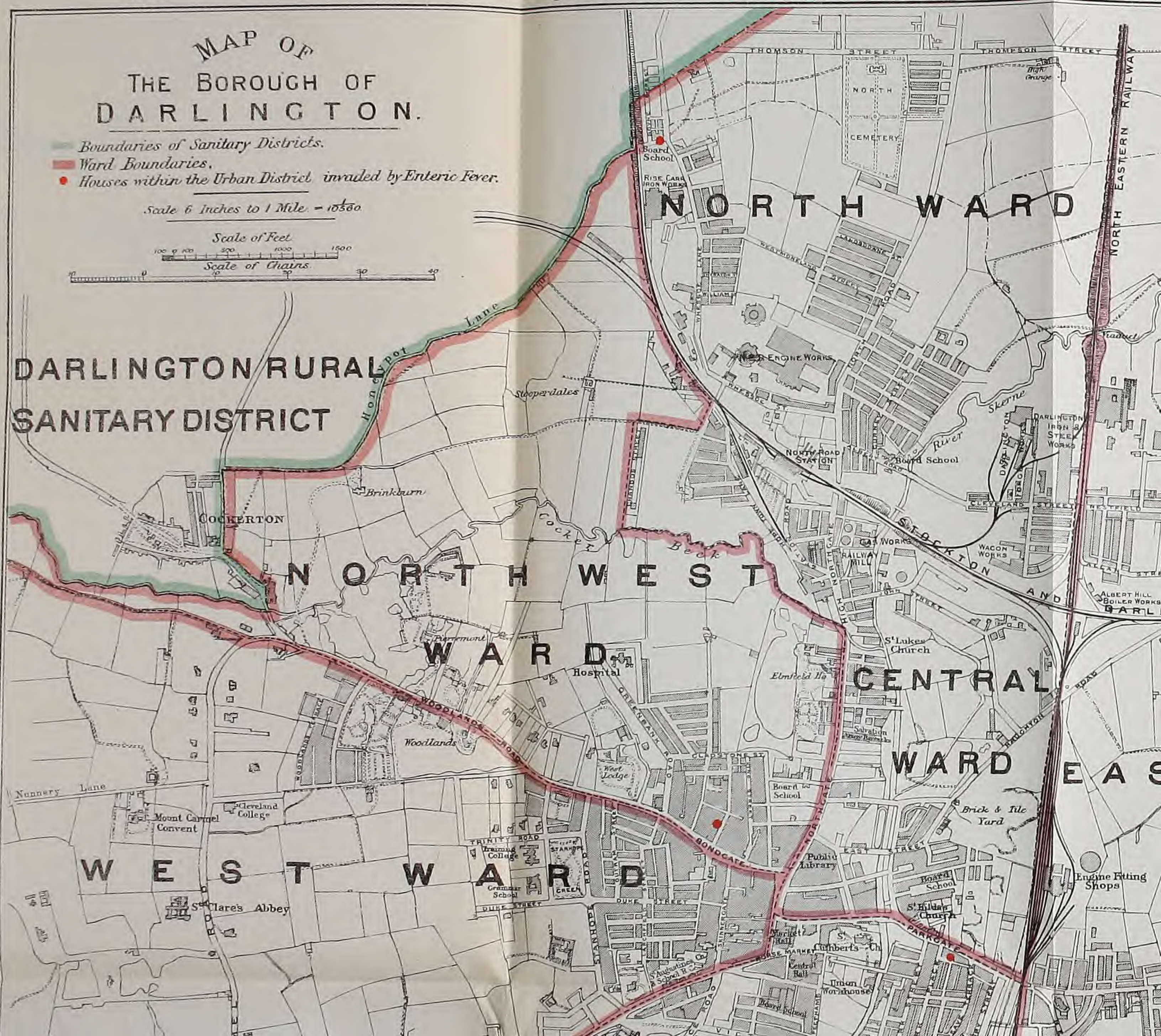
WARD

CENTRAL

WARD EAS

WESTWARD

Fortnight ended November, 1st 1890.



Fortnight ended September, 20th 1890.



Fortnight ended October, 4th 1890.



Fortnight ended October. 18th 1890.



Fortnight ended November, 1st 1890.



Fortnight ended September 20th 1890

STOCKTON RURAL SANITARY DISTRICT

MAP
THE COUNTY
MIDDLESB
And the Most Thick
THE LOCAL BOAR
ORME

Boundaries of Sanitary
Ward Boundaries.
Houses within the Urban

Scale, 6 Inches

Scale of
100 p 100
Scale of



Fortnight ended October 4th 1890.

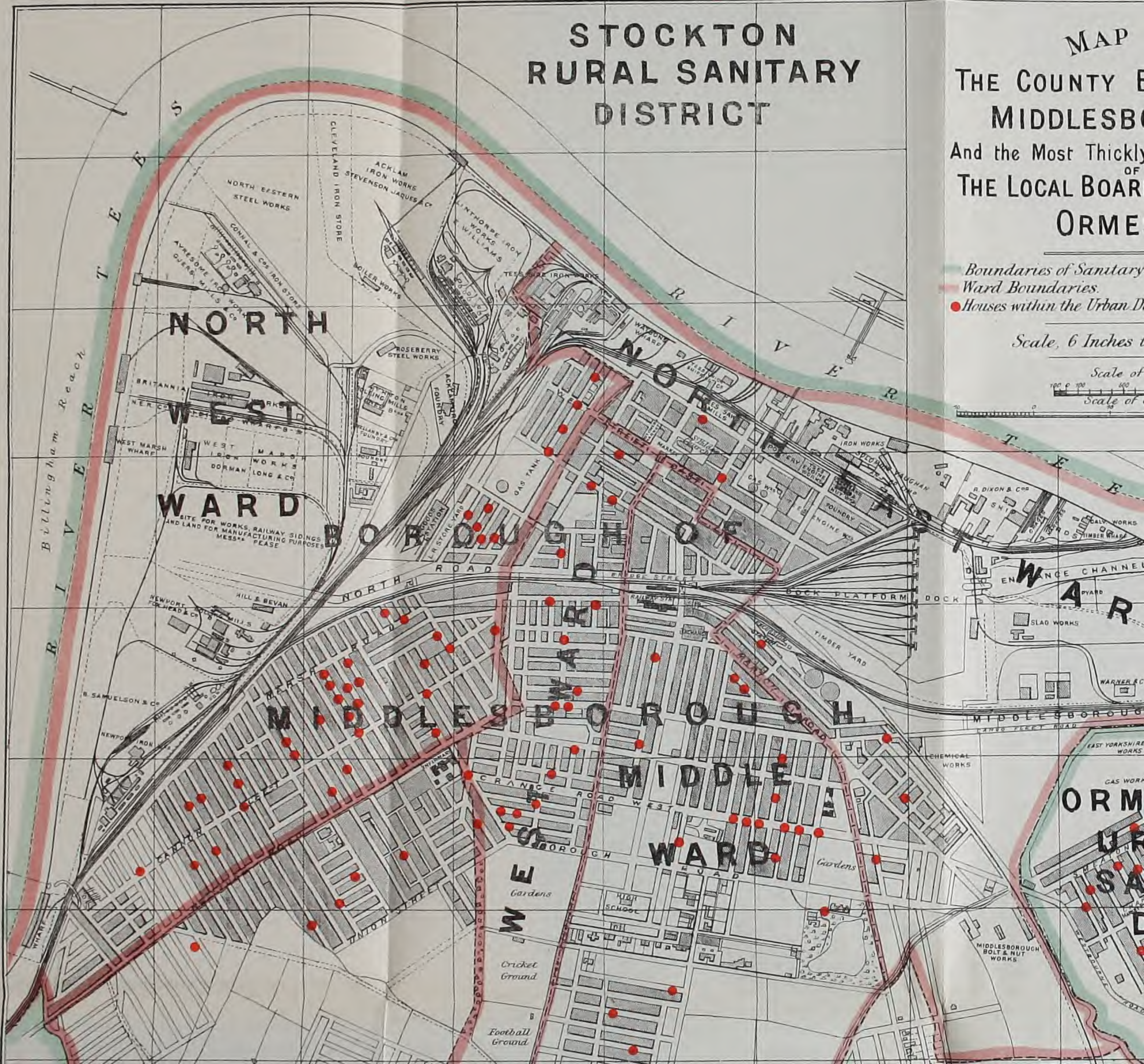
STOCKTON RURAL SANITARY DISTRICT

MAP
THE COUNTY OF
MIDDLESBOROUGH
And the Most Thickly
OF
THE LOCAL BOARD
ORME

Boundaries of Sanitary
Ward Boundaries.
● Houses within the Urban District

Scale, 6 Inches to a Mile

Scale of
100 0 100 200
Scale of



Fortnight ended October 18th 1890.



Fortnight ended November, 1st 1890.

STOCKTON RURAL SANITARY DISTRICT

MAP
THE COUNTY
MIDDLESB
And the Most Thickl
OF
THE LOCAL BOAR
ORME

Boundaries of Sanitary
Ward Boundaries.
Houses within the Urban L

Scale, 6 Inches

Scale of
100 0 100 500
Scale of



TABLE XVIII.

SHOWING for STOCKTON-ON-TEES the NUMBER and RATEABLE VALUES of DWELLING-HOUSES situate in the several WARDS comprised within the BOROUGH.

Sanitary
Districts.
General
Description.
Stockton-on-
Tees, U.S.D.

Ward	Number of Dwelling houses rated at						Total Houses on Rate Books, October 1890.	Per-centage of Total Houses rated at					
	Under 5 <i>l</i> .	5 <i>l</i> . and under 10 <i>l</i> .	10 <i>l</i> . and under 20 <i>l</i> .	20 <i>l</i> . and under 30 <i>l</i> .	30 <i>l</i> . and under 40 <i>l</i> .	40 <i>l</i> . and up-wards.		Under 5 <i>l</i> .	5 <i>l</i> . and under 10 <i>l</i> .	10 <i>l</i> . and under 20 <i>l</i> .	20 <i>l</i> . and under 30 <i>l</i> .	30 <i>l</i> . and under 40 <i>l</i> .	40 <i>l</i> . and up-wards.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
Parkfield - - -	6	543	140	12	8	13	722	0·8	75·2	19·4	1·7	1·1	1·8
South-West - - -	4	536	261	71	48	29	949	0·4	56·5	27·5	7·5	5·1	3·0
West End - - -	45	714	103	11	4	15	892	5·1	80·1	11·5	1·2	0·4	1·7
Exchange - - -	185	256	387	58	27	102	1,015	18·2	25·2	38·2	5·7	2·7	10·0
Central - - -	90	567	305	41	20	30	1,053	8·6	53·8	29·0	3·9	1·9	2·8
North-West - - -	65	595	117	8	5	9	799	8·1	74·5	14·6	1·0	0·7	1·1
Tilery - - -	80	643	60	5	—	4	792	10·1	81·2	7·6	0·6	0·0	0·5
Victoria - - -	31	903	69	32	21	24	1,080	2·9	83·6	6·4	3·0	1·9	2·2
Portrack - - -	290	377	65	9	2	7	750	38·7	50·2	8·7	1·2	0·3	0·9
South-East - - -	309	390	172	71	34	90	1,066	29·0	36·6	16·1	6·7	3·2	8·4
Borough of Stockton-on-Tees - - - }	1,105	5,524	1,679	318	169	323	9,118	12·1	60·6	18·4	3·5	1·9	3·5

From this table it appears that upwards of 72 per cent. of the houses of Stockton-on-Tees have rateable values under 10*l*., and are consequently of the cottage class; that this proportion is considerably exceeded in the wards of Tilery (91 per cent.), Portrack (89 per cent.), Victoria (86 per cent.), West End (85 per cent.), and North-west (82 per cent.); and that the proportion of houses having rateable values under 5*l*. is highest in the Portrack (38 per cent.) and South-east (29 per cent.) wards respectively. As a result of my inspection, I have no hesitation in saying that in these last-named wards the house accommodation was of a distinctly lower class than in the other wards.

The house accommodation of the poorer classes is fair on the whole, the poorest class of houses being, with rare exceptions, of two stories, with, as a rule, ample means of lighting and ventilation. There are a few tenements or single-room dwellings on the quay side in the South-east ward, but elsewhere such houses are rarely to be met with. During recent years the Sanitary Authority have taken vigorous action in dealing with dwellings in such a condition as to be injurious to the health of the inmates, and many houses have been permanently closed. The Sanitary Authority have also dealt energetically with back-to-back houses, and with houses having no means for through lighting or ventilation.

Numerous courts exist in Stockton behind the principal streets, more especially in the South-east, Exchange, Central, and Victoria Wards. These courts are entered by narrow thoroughfares at intervals in a line of front houses and shops, but at the time of my inspection their sanitary conditions as regards surface cleanliness and freedom from nuisance left little to be desired.

The streets and back streets generally throughout the borough are well paved, in fact, in many instances the Sanitary Authority have insisted upon the streets being made and paved prior to their allowing the erection of houses. In some of the outlying portions of the borough, and especially in the Portrack Ward, the condition of streets and backways was found not to be so satisfactory. The cleansing of streets and thoroughfares throughout the borough appeared at the time of my inspection to be efficiently performed.

As regards the prevalence of Enteric Fever in Stockton-on-Tees during the two six-week-periods (September 7th—November 1st, 1890, and December 28th, 1890—February 7th, 1891), it has already been noted that there was excessive fever incidence in each of the several wards of the borough. And from a comparison of Table XVIII. with

Tables XV. and XVI., it would appear that the *degree* of incidence was independent of the character of the house accommodation. Thus it will be seen that in the South-east Ward, which probably contains the lowest class of dwellings in the borough, the incidence of Enteric Fever was lighter than in any of the other wards, whilst, on the other hand, the West End, Tilery, Portrack, and Parkfield Wards, where the house accommodation varies greatly in character, suffered heavy incidence.

Stockton Rural Sanitary District.—The Stockton Rural District, which in 1881 had an area of about 35,900 acres, was, owing to the extension of the borough of Stockton-on-Tees, at the census of 1891 reduced in area to a little over 30,000 acres. The district, which comprises 16 parishes, is situate in Durham to the north of the Tees, and extends from the Darlington Rural Sanitary District to the mouth of the river. It is roughly triangular in shape, the base or south-eastern boundary being formed, with the exception of the portion contiguous to the borough of Stockton-on-Tees throughout by the River Tees. On the west it is bounded by the Rural Sanitary Districts of Darlington and Sedgfield, and on the north by that of Hartlepool.

The diminished district had in 1891 a population of 11,961 persons, living in 2,253 houses, the population of the same area in 1881 being 9,489 persons. The principal centres of population, with their approximate elevations above Ordnance datum, are as follows:—Wolviston (97 feet), situate near the northern boundary; Carlton Iron Works (180 feet), in the parish of Whitton, near the north-western boundary; Norton (50 to 100 feet), situate immediately to the north of the borough of Stockton-on-Tees; Long Newton (147 feet), in the western portion of the district; Eaglescliffe Junction (90 feet) and Eaglescliffe (70 feet), both in the parish of Eaglescliffe, situate on the north bank of the River Tees to the west of Stockton. The parish of Billingham, which lies immediately to the east of Norton, contains two villages, Billingham (50 feet), situate about a mile east of Norton, and Haverton Hill (20 feet), on the north bank of the Tees, opposite to Middlesbrough; the parish of Cowpen Bewley, which lies immediately to the east of the parish of Billingham, also contains two villages, Cowpen (20 feet), near the northern boundary, and Port Clarence (13 feet), at the south-eastern extremity of the district, on the River Tees, at the commencement of its estuary.

The subsoil consists chiefly of clay, but at Norton and Billingham it is of gravel and sand overlying clay.

About one-third of the inhabitants are engaged in agriculture, the majority of the remaining two-thirds in ironworks, potteries, salt, and soda works. There is a considerable residential population at Eaglescliffe Junction and at Norton.

The dwellings of the poorer classes are built of brick, and consist, as a rule, of two stories, with garden ground or yards at the rear. Since 1882 the erection of all buildings has been controlled by the Sanitary Authority under byelaws allowed in that year. There is very little crowding of dwellings upon area. At Norton a couple of courtyards hemmed round by houses exist, and these, I was informed, were the only courts in the district. At the time of my inspection their condition was fairly good. At Port Clarence there are some back-to-back houses, but here there are spacious roadways between the rows.

The main roads throughout the district are macadamized, and are apparently fairly well kept, but the subsidiary and back streets in many parts of the district were in a very unsatisfactory condition at the time of my visit, being unmade, unpaved, and filthy. This was notably the case with respect to some streets of this class at Norton, at Carlton Iron Works, and at Haverton Hill.

In this district cases of Enteric Fever were reported to have occurred during the two six-week-periods already referred to, in the following villages only:—Port Clarence, Haverton Hill, Billingham, Norton, Carlton Iron Works, Eaglescliffe, Eaglescliffe Junction, and Uray Nook.

As regards dwellings and their surroundings, the invaded villages did not differ in any material respect from those not invaded.

Middlesbrough Urban Sanitary District.—The borough of Middlesbrough, which has an area of 2,731 acres, is situate in Yorkshire to the south of the River Tees, at a distance of some seven miles from the sea. The river forms its northern boundary, whilst on the west and south-west it is bounded by portions of the Middlesbrough Rural, and on the south-east by the Ormesby Urban Sanitary District. The district had in 1881 a population of 55,934 persons, which had increased in 1891 to 75,516

persons, living in 13,306 houses. About one-fourth of the area of the borough is continuously covered with houses. The older portion of the town (none of which dates back further than 60 years) is almost entirely comprised within the north-west and north-east wards, although a small number of the older houses are to be found in the northern portions of the west and middle wards. The bulk of the houses in the west and middle wards are of modern construction, whilst the south ward, which contains some of the most recently built houses, includes the village of Linthorpe, as well as a considerable area of agricultural land.

The borough, as a whole, is flat and low-lying, the greatest elevation in the older part being at the Old Town Hall, where a height of 40 feet above ordnance datum is reached. In the north-west ward for a considerable area comprising Marsh Road and neighbourhood, the elevation varies from 14 to 16 feet, and in the rest of the borough the average elevation is little over 20 feet, except at Linthorpe, where 40 feet above datum is again reached.

The subsoil in the north-west and north-east wards, and in the northern parts of the west and middle wards, consists chiefly of sand and gravel, except in the neighbourhood of Marsh Road, where it is of peat. A considerable proportion of "made" land exists also in this part of the district, the materials used having consisted of slag and ballast. In the south ward and the southern portions of the west and middle wards, the subsoil is clay, in many cases overlying gravel and sand. The ground water is said not to be reached at a depth of 30 feet.

The industries of Middlesbrough consist of iron and steel works, blast furnaces, brick works, chemical works (aniline and artificial alizarine dyes), and shipbuilding. There are also spacious docks, which give employment to a number of persons, and a large shopkeeping population.

In the following Table XIX., which I have drawn up from information supplied to me by Mr. J. M'Parnaby, the borough accountant, are shown the number and rateable values of the houses contained in the several wards of the borough; the proportion of houses of each class is also given.

TABLE XIX.

SHOWING for MIDDLESBROUGH the NUMBER and RATEABLE VALUES of DWELLING-HOUSES situate in the several WARDS comprised within the BOROUGH.

Wards.	Number of Houses rated at						Total Houses on Rate Books, 1890.	Per-centage of Total Houses rated at					
	Under 5 <i>l</i> .	5 <i>l</i> . and under 10 <i>l</i> .	10 <i>l</i> . and under 20 <i>l</i> .	20 <i>l</i> . and under 30 <i>l</i> .	30 <i>l</i> . and under 40 <i>l</i> .	40 <i>l</i> . and up-wards.		Under 5 <i>l</i> .	5 <i>l</i> . and under 10 <i>l</i> .	10 <i>l</i> . and under 20 <i>l</i> .	20 <i>l</i> . and under 30 <i>l</i> .	30 <i>l</i> . and under 40 <i>l</i> .	40 <i>l</i> . and up-wards.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
South - - -	180	987	364	36	17	7	1,591	11·3	62·0	22·9	2·3	1·1	0·4
West - - -	287	1,878	476	86	47	82	2,856	10·0	65·8	16·7	3·0	1·6	2·9
Middle - - -	114	2,021	916	192	56	113	3,412	3·3	59·3	26·9	5·6	1·6	1·3
North-East - - -	492	1,311	264	51	16	25	2,159	22·8	60·7	12·2	2·4	0·7	1·2
North-West - - -	1,284	2,372	186	66	28	12	3,948	32·5	60·1	4·7	1·7	0·7	0·3
Borough of Middlesbrough	2,357	8,569	2,206	431	164	239	13,966	16·8	61·4	15·8	3·1	1·2	1·7

From the above table it appears that upwards of 78 per cent. of the houses have rateable values under 10*l*., and are consequently of the cottage class; that this proportion is considerably exceeded in the lower parts of the town comprised within the north-west and north-east wards, where the proportion of houses having rateable values under 10*l*., reaches upwards of 92 and 83 per cent. of the total houses in these wards respectively.

The houses are built of brick, and they are all of comparatively modern date. The surroundings of the houses of the poorer classes situate in the so-called "slums" of Middlesbrough, as, for example, houses and yards off Durham and Commercial Streets, are in favourable contrast with those inhabited by the poorer class of the respectable

labouring population in other towns—the yards being almost, without exception, paved with slag bricks set in cement and provided with proper surface drainage; the yards themselves kept swept and free from nuisance.

There is comparatively little crowding together of houses upon area in Middlesbrough. The courts or yards are, as a rule, fairly open, and but few back-to-back houses exist. There are, however, a number of houses in the older parts of the town, without back windows or outlets in the rear; but there are said to be less than a dozen tenemented houses in the whole borough.

The roadways and streets, which are macadamized, are clean and well scavenged, and backyards, as a rule, are (as has been said) paved, flagged, or concreted, and provided with surface drainage. The means of access to the rear of dwellings in the older parts of the town consist of back passages three feet wide, and in the more modern part of the town (constructed during the last 20 years) of back roads nine feet wide. A number of the back passages and roads are paved, but the great majority were, at the time of my inspection, unpaved, and frequently unswept and filthy.

As regards the prevalence of Enteric Fever in Middlesbrough during the two six-week-periods (7th September to 1st November 1890 and 28th December 1890 to 7th February 1891) it has already been noted that there was excessive fever incidence on each of the wards of the borough. And from a comparison of Table XIX. with Tables XV. and XVI. it would appear that the degree of incidence was, as in Darlington and Stockton-on-Tees, independent of the character of the house accommodation. Thus it will be seen that the heaviest incidence of Enteric Fever occurred on the north-west and in the south wards, wards which contain respectively the oldest and most modern houses in the borough.

South Stockton Urban Sanitary District.—The South Stockton Urban District, which has an area of 1,052 acres, is situate in the Middlesbrough Registration District, to the west of the borough of Middlesbrough, and immediately to the south of the borough of Stockton-on-Tees, from which it is separated by the River Tees. The river forms its western and northern boundary, whilst on the south and east it is bounded by portions of the Middlesbrough Rural Sanitary District. South Stockton had in 1881 a population of 10,665 persons, which had increased in 1891 to 15,476 persons, living in 2,696 houses.

South Stock-
ton U.S.D.

The town is built on the northern portion of the district. The part near to the river is low-lying, having an elevation of little over 20 feet above Ordnance datum; from here, however, the ground rises towards the south, until at the limits of the town in this direction an elevation of from 40 to 50 feet above datum is reached.

The subsoil consists of brick clay overlying marl. The inhabitants are employed in iron working in all its branches, shipbuilding, and pottery making.

As will be seen from the following Table XX., compiled from information furnished me by Mr. Marwood, the great majority of the houses in the district are of the cottage class, upwards of 88 per cent. having rateable values under 10*l.*

TABLE XX.

SHOWING for SOUTH STOCKTON the NUMBER and RATEABLE VALUES of DWELLING-HOUSES situate in the URBAN SANITARY DISTRICT.

		Houses rated at						Total Houses on Rate Books, October 1890.
		Under 5 <i>l.</i>	5 <i>l.</i> and under 10 <i>l.</i>	10 <i>l.</i> and under 20 <i>l.</i>	20 <i>l.</i> and under 30 <i>l.</i>	30 <i>l.</i> and under 40 <i>l.</i>	40 <i>l.</i> and upwards.	
South Stockton Urban Sanitary District.	Number	402	1,933	196	72	31	10	2,644
	Rate per cent. of total.	15·2	73·1	7·4	2·7	1·2	0·4	—

The houses, which are almost without exception two stories in height, are built of brick. Each house has a paved yard of varying dimensions, with separate (outside) water tap and ashpit privy. The means of lighting and ventilation are good as a rule. There is an absence of back-to-back houses and of houses without back doors or windows in South Stockton. The arrangement of houses in courts is not observed

Sanitary
Districts.

General
Description.

South Stock-
ton U.S.D.

Ormesby
U.S.D.

in the district. The yard space in rear of many of the older houses is, however, confined, and the existing byelaws do not secure the provision of adequate space about houses.

The streets and back streets throughout the town are well paved and kept in admirable condition.

As regards the incidence of Enteric Fever, it will be observed from an examination of Maps VII.-IX., that the houses invaded during the first six-week-period (September 7th to November 1st, 1890), were scattered over the town. During the second six-week-period (December 28th, 1890, to February 7th, 1891), a similar general dissemination of the disease occurred in the district quite irrespective of the character of the house accommodation.

Ormesby Urban Sanitary District.—The Ormesby Urban District, which has an area of 2,836 acres, is situate to the south-east of the borough of Middlesbrough. On the north and north-west, it is bounded by Middlesbrough, on the east by the Urban Sanitary District of Normanby, and on the south and south-west by portions of the Rural Sanitary Districts of Guisbrough and Middlesbrough respectively. The district had in 1881 a population of 7,719 persons, which had increased in 1891 to 8,629 persons, living in 1,558 houses.

The northern portion of the district lies low, having an average elevation of from 20 to 25 feet above Ordnance datum. The ground rises towards the south, and in this part of the district an elevation of upwards of 300 feet above datum is reached.

There are two centres of population in the district, namely, North Ormesby (elevation about 25 feet), situate on the low-lying northern portion, close to the borough of Middlesbrough and forming a suburb of that town, and South Ormesby (elevation, about 100 feet), an agricultural village situate on the slopes of the elevated southern portion of the district.

The subsoil upon which the houses in both North and South Ormesby are built, is stated to consist of a stiff yellow clay.

The inhabitants of North Ormesby are chiefly ironworkers, engaged in the Middlesbrough trades. In South Ormesby they are engaged wholly in agriculture.

As will be seen from the following Table XXI., compiled from information obtained from the rate-books, the great majority of the houses in the district are of the cottage class, upwards of 85 per cent. having rateable values under 10*l*.

TABLE XXI.

SHOWING for ORMESBY the NUMBER and RATEABLE VALUES of DWELLING HOUSES situate in the Separate Centres of Population comprised within this URBAN SANITARY DISTRICT.

Separate Centres of Population in the District.		Houses rated at						Total Houses on Rate Books, October 1890.
		Under 5 <i>l</i> .	5 <i>l</i> . and under 10 <i>l</i> .	10 <i>l</i> . and under 20 <i>l</i> .	20 <i>l</i> . and under 30 <i>l</i> .	30 <i>l</i> . and under 40 <i>l</i> .	40 <i>l</i> . and upwards.	
North Ormesby	Number - -	153	1,142	156	36	8	11	1,506
	Per cent. of total	10·2	75·8	10·4	2·4	0·5	0·7	—
South Ormesby	Number - -	21	25	11	8	1	4	70
	Per cent. of total	30·1	35·7	15·7	11·4	1·4	5·7	—
Ormesby Urban Sanitary Dis- trict - -	Number - -	174	1,167	167	44	9	15	1,576
	Per cent. of total	11 0	74·2	10·6	2·8	0·6	0·8	—

The town of North Ormesby occupies an area of about 50 acres, and is regularly built, with streets at right angles to one another. The houses, which are all of comparatively modern construction, are built of brick, and are, as a rule, two stories in height. There are no back-to-back houses, and little crowding of houses upon area exists in the district. The free circulation of air in the rear of dwellings is interfered with in the case of some half dozen of the older blocks, owing to the fact that in these instances the only means of access to the back streets is obtained through an archway at either end of the block.

The main streets are macadamised with slag and whinstone, and are, as a rule, well kept. The back streets at the time of my inspection were commonly unpaved, and in many instances unswept and filthy.

In South Ormesby the houses are scattered, with, as a rule, ample space around them.

The incidence of Enteric Fever during the two six-week-periods already referred to was entirely confined to the town of North Ormesby, not a single case being reported to have occurred in South Ormesby. From an examination of Maps XI.-XIII., it will be seen, that as regards North Ormesby, the houses invaded during the first six-week-period (September 7th to November 1st, 1890), were scattered over the town; and that during the second six-week-period (December 28th, 1890, to February 7th, 1891), a similar general dissemination of the disease took place. In fact, in the two periods taken collectively upwards of two per cent. of the houses in North Ormesby were invaded, and these houses were situate in every street in the town.

Normanby Urban Sanitary District.—The Normanby Urban District, which has an area of 1,413 acres, is situate immediately to the east of the Ormesby Urban District, and consists of a narrow strip of land extending from the River Tees, which forms its northern boundary, to the southern boundary of the Middlesbrough Registration District, where it adjoins the Guisbrough Rural Sanitary District. It is bounded on the west and east by the Ormesby and Eston Urban Sanitary Districts respectively. The district had in 1881 a population of 7,714 persons, which had increased in 1891 to 9,128 persons, living in 1,654 houses.

The Normanby District is similar in character to that of Ormesby, the northern portion near the river being low-lying and having an elevation of less than 25 feet above Ordnance datum, whilst the ground rises towards the south to an elevation of upwards of 700 feet above datum.

There are two centres of population in the district, South Bank (elevation, 25 feet), and Normanby (elevation, 150 feet), situate in the northern and southern portions respectively.

The subsoil of South Bank is stated to consist of clay, alternating with sand and sandy clay, and that of Normanby of yellow clay, gravel, and sand.

The inhabitants of South Bank are employed in ironworks and in shop-keeping, whilst those of Normanby are chiefly engaged in ironstone mining, and in agriculture.

From the following Table XXII., compiled from information obtained from the rate-books, it will be seen that, as in the neighbouring districts, the great majority of the houses are of the cottage class, upwards of 89 per cent. having rateable values under 10*l*.

TABLE XXII.

SHOWING for NORMANBY the NUMBER and RATEABLE VALUES of DWELLING-HOUSES situate in the separate Centres of Population comprised within this URBAN SANITARY DISTRICT.

Separate Centres of Population in the District.		Houses rated at						Total Houses on Rate Books, October 1890.
		Under 5 <i>l</i> .	5 <i>l</i> . and under 10 <i>l</i> .	10 <i>l</i> . and under 20 <i>l</i> .	20 <i>l</i> . and under 30 <i>l</i> .	30 <i>l</i> . and under 40 <i>l</i> .	40 <i>l</i> . and upwards.	
South Bank	Number -	202	1,073	105	29	3	10	1,422
	Rate per cent. of total.	14·2	75·5	7·4	2·0	0·2	0·7	—
Normanby	Number -	92	143	22	4	3	2	226
	Rate per cent. of total.	34·6	53·7	8·3	1·5	1·1	0·8	—
Normanby Urban Sanitary Dis- trict -	Number -	294	1,216	127	33	6	12	1,688
	Rate per cent. of total.	17·4	72·0	7·5	2·0	0·4	0·7	—

The town of South Bank, which covers about 50 acres of ground, is of modern construction, and very similar in character to that of North Ormesby. The houses are of brick, and mostly of two stories, arranged along the sides of wide streets built at right angles to each other. There are no back-to-back houses in the district, and the means of lighting and ventilation are, as a rule, satisfactory. One or two of the back streets are entered under archways, as at North Ormesby, but the great majority of these streets are open at both ends. A number of houses in the village of Normanby are of older construction than those in South Bank, but here also there is little crowding of dwellings upon area.

The roadways throughout the district are macadamized and well kept. The back streets at the time of my visit were unpaved, and in many instances unsatisfactory as regards surface drainage and cleanliness.

As regards the incidence of Enteric Fever, during the two six-week-periods already referred to taken collectively, in South Bank, upwards of 4 per cent. of the houses were invaded, whilst in Normanby 1·5 per cent. of the houses only were invaded, all of them in the first six-week-period (7th September to 1st November 1890).

Eston Urban Sanitary District.—The Eston Urban District which has an area of 2,250 acres, is situate immediately to the east of the Normanby District, and like it consists of a strip of land extending from the River Tees, which forms its northern boundary, to the southern boundary of the Middlesbrough Registration District, where it adjoins the Urban Sanitary District of Guisbrough. It is bounded on the west by the Normanby Urban District, and on the east by the parish of Wilton, which forms part of the Guisbrough Rural Sanitary District.

Eston was constituted an Urban District in 1884, prior to which date it had formed part of the Middlesbrough Rural Sanitary District. In 1881 the area now forming the Eston Urban District had a population of 6,297 persons, which had increased in 1891, to 10,695 persons, living in 1,924 houses.

The Eston District is in many respects similar in character to the Urban Districts of Normanby and Ormesby, the northern portion near the river being low lying and flat, and having an elevation of 25 feet or less above Ordnance datum. The level of the district rises towards the south, until at the southern extremity a height of some 800 feet above Ordnance datum is reached. It contains three chief centres of population, namely South Bank (elevation about 25 feet) situate at the north-west corner of the district, and forming part of the town of South Bank, the major portion of which is comprised within the Normanby District; Grange Town (elevation 35 feet), situate to the north-east of South Bank, and South Eston with California (elevation 150 feet), situate on the southern slope of the district.

The subsoil is stated to consist, at South Bank, of clay and sand, at Grange Town, of stiff clay, and at South Eston and California of light loamy clay overlying a thin bed of gravel.

The inhabitants of South Bank and Grange Town are employed in iron and steel works, blast furnaces, and salt works, and those of South Eston and California in agriculture and in ironstone mining.

The following Table XXIII., compiled from information obtained from the rate books, shows that upwards of 90 per cent. of the houses are of the cottage class, having rateable values under 10*l.* It will also be noted that whilst none of the houses at Grange Town have rateable values under 5*l.*, upwards of 70 per cent. of those at South Eston are rated at that low figure:—

TABLE XXIII.

SHOWING for ESTON the NUMBER and RATEABLE VALUES of DWELLING-HOUSES situate in the SEPARATE CENTRES of POPULATION in this URBAN SANITARY DISTRICT.

Separate Centres of Population in the District.		Houses rated at						Total Houses on Rate Books October 1890.
		Under 5 <i>l.</i>	5 <i>l.</i> and under 10 <i>l.</i>	10 <i>l.</i> and under 20 <i>l.</i>	20 <i>l.</i> and under 30 <i>l.</i>	30 <i>l.</i> and under 40 <i>l.</i>	40 <i>l.</i> and upwards.	
Grange Town	Number	—	825	43	18	2	1	889
	Rate per cent. of total.	—	92·9	4·8	2·0	0·2	0·1	—
South Eston and California.	Number	482	122	47	19	1	3	674
	Rate per cent. of total.	71·5	18·1	7·0	2·8	0·15	0·45	—
South Bank, Branch End, &c.	Number	45	295	18	9	1	3	371
	Rate per cent. of total.	12·1	79·5	4·9	2·4	0·3	0·8	—
Eston Urban Sanitary Dis- trict.	Number	527	1,242	108	46	4	7	1,934
	Rate per cent. of total.	27·2	64·3	5·6	2·4	0·2	0·2	—

Grange Town is of quite modern construction, all the houses having been erected since 1882. It occupies an area of about 30 acres, and is very regularly built, the houses being constructed in parallel rows with cross streets at right angles. They are of good class, with ample space around them. The South Bank portion of the district occupies about 10 acres, and the houses and their surroundings are practically identical in character with those described as forming the portion of South Bank under the jurisdiction of the Normanby Urban Sanitary Authority. At South Eston and California a considerable number of the houses were erected some 30 years ago, but here also there is sufficiency of space around dwellings.

The main roads throughout the district are macadamised and well kept. The back streets, which are of fair width, and in all cases open at both ends, were at the time of my inspection in process of being paved.

As regards the incidence of Enteric Fever during the two six-week-periods already referred to taken collectively, 3 per cent. of the houses in South Bank, 2·5 per cent. of those in Grange Town, and 1·8 per cent. of those in South Eston were invaded by the disease. These houses were scattered throughout the district, the incidence of the fever being quite irrespective of the state of dwellings or of their surroundings.

Kirkleatham Urban Sanitary District.—The Kirkleatham Urban District, which has an area of 4,330 acres, is situate at the north-eastern extremity of Yorkshire, at the mouth of the River Tees. It is roughly triangular in shape, with its apex towards the south. On the northern side, or base, it is bounded partly by the estuary of the Tees and partly by the sea; on the west it is separated from the Urban Sanitary District of Eston by the parish of Wilton, which forms part of the Guisbrough Rural District, and on the east partly by the Urban Sanitary District of Redcar and partly by a portion of the Guisbrough Rural District. The district had in 1881 a population of 3,898 persons, which in 1891 had increased to 4,209 persons, living in 841 houses.

The northern portion of the district is low-lying and flat, with an elevation of from 20 to 25 feet above Ordnance datum. From thence the ground rises towards the south, and near the southern extremity an elevation of nearly 400 feet is reached.

There are four or five centres of population in the district, the chief of which, Coatham (elevation 24 feet), situate at the north-eastern extremity, is virtually part of Redcar, a well-known seaside resort, one side of the main street being in the Redcar, and the other side in the Kirkleatham Urban Sanitary Districts respectively. Immediately to the west of Coatham, and likewise situate on the sea coast, is the village of Warrenby (elevation 20 feet). The village of Kirkleatham, from whence the district takes its name, which is situate some four miles from the sea, has an elevation of from 60 to 70 feet, and about a mile to the south of this village, and at a still higher elevation, lies the hamlet of Yearby (elevation 120 feet).

The subsoil is stated to consist, at Coatham, of sand; at Warrenby, of sand and clay; at Kirkleatham, Yearby, and other hamlets (Dinsdale and West Coatham), mainly of clay and clayey loam.

The inhabitants of Warrenby and Dinsdale are chiefly employed in ironworks and ironstone mining, and those of Kirkleatham and other hamlets in agriculture. Coatham is a residential seaside resort, where a number of the inhabitants earn a livelihood by letting lodgings, by shopkeeping, and by fishing.

From the following Table XXIV., compiled from information obtained from the rate books, it appears that the proportion of houses of the cottage class is considerably lower in this district as a whole than in any of the other districts which have been under consideration, some 47 per cent. only of the houses having rateable values under 10/. But upon examination of the figures for the several villages it will further be noted that whilst in the villages of Dinsdale and Warrenby nearly all the houses are of the cottage class, in Coatham the proportion of these houses is only some 25 per cent., and that 51 per cent. have here rateable values of from 10/. to 20/., and over 23 per cent. rateable values of 20/. and upwards.

TABLE XXIV.

SHOWING for KIRKLEATHAM the NUMBER and RATEABLE VALUES of the HOUSES situate in the SEPARATE CENTRES of POPULATION in this URBAN SANITARY DISTRICT.

Sanitary
Districts.
General
Description.
Kirkleatham
U.S.D.

Separate Centres of Population in the District.		Houses rated at						Total Houses on Rate Books, October 1890.
		Under 5l.	5l. and under 10l.	10l. and under 20l.	20l. and under 30l.	30l. and under 40l.	40l. and upwards.	
Coatham	Number -	47	106	308	97	22	21	601
	Rate per cent. of total.	7·8	17·6	51·3	16·1	3·7	3·5	—
Warrenby	Number -	96	67	5	—	—	1	169
	Rate per cent. of total.	56·8	39·6	3·0	—	—	0·6	—
Dinsdale	Number -	71	—	—	—	—	—	71
	Rate per cent. of total.	100·0	—	—	—	—	—	—
Yearby	Number -	32	10	16	—	—	3	61
	Rate per cent. of total.	52·5	16·4	26·2	—	—	4·9	—
Kirkleatham Urban Sanitary District	Number -	246	183	329	97	22	25	902
	Rate per cent. of total.	27·3	20·3	36·5	10·7	2·4	2·8	—

The town of Coatham is well laid out, and, as already stated, most of the houses are of a superior class; and they have, as a rule, ample space about them. In some parts of the town, however, small blocks of dwellings are so arranged as to impede the circulation of air, and some cases were observed where the yard-space in rear of houses has been partially built over. At Warrenby the houses, which are almost without exception of the cottage class, are arranged in parallel rows, and appear in many instances to be flimsily built. There is, however, here little crowding of houses upon area. The paving of the yards in this portion of the district was noticed to be frequently very defective. In the remaining hamlets the houses are either scattered or arranged in isolated rows. The condition of the houses appeared to be fair, but in some instances the foundations were damp, owing to the want of proper cave spouts.

The main roads throughout the district are macadamised and apparently well kept. The back streets at Coatham were, at the time of my inspection, as a rule, in a satisfactory condition, but at Warrenby they were unpaved, unmade, unswept, and frequently filthy.

As regards the incidence of Enteric Fever during the two six-week-periods taken collectively, 2·5 per cent. of the houses in Coatham and 1·8 per cent. of those in Warrenby were invaded by that disease; but not a single case was reported to have occurred at Kirkleatham, Dinsdale, Yearby, or West Coatham.

Summary.—From the notes given at the end of the several sections dealing with the separate sanitary districts, it is clear that as regards elevation, subsoil, nature of house accommodation, surface cleanliness, and industries of the population great diversities existed, and that consequently as regards these matters, no community of circumstance prevailed in the districts invaded by Enteric Fever, sufficing for explanation of the sudden and simultaneous incidence of the disease that was witnessed.

(2.) EXCREMENT AND REFUSE DISPOSAL.

Excrement
and Refuse
Disposal.
Darlington
U.S.D.

Darlington Urban Sanitary District.—The prevailing system employed in Darlington for the disposal of excrement and refuse is that known as the privy midden system. This, as in use at Darlington, and actually enforced by the byelaws, embodies all the worst features of the old privy midden, the middens being large in capacity, uncovered, with the pit sunk below the surface level and drained into the common sewers. The middens are stated to be emptied at intervals of from four to six weeks, scavenging being effected during the dark night hours from 12 p.m. to 6 a.m. in summer, and from 10 p.m. to 8 a.m. in winter. In addition, the method of scavenging is extremely unsatisfactory, the midden contents being shovelled out and thrown on the unpaved back streets before being carted away, a process which always leaves some deposit

behind. In the following Table XXV. are given the results of an inquiry made in 1890 by Mr. Atkinson, the Inspector of Nuisances, with the object of ascertaining the actual number of waterclosets, pan closets, privy middens of different forms, and ashpits existing in the borough.

TABLE XXV.

Darlington
U.S.D.

SHOWING for DARLINGTON the NUMBER of WATERCLOSETS, UNCOVERED PRIVY MIDDENS, COVERED PRIVY MIDDENS, and PAN CLOSETS in use in December 1890, in each of the WARDS of the BOROUGH.

Wards.	Method of Excrement Disposal.				Uncovered Middens each connected with					Covered Middens each connected with				“ Dry ” Ashpits.	Ash Boxes.
	Waterclosets.	Midden Privies.		Pan Closets.	One Privy.	Two Privies.	Three Privies.	Four Privies.	Total.	One Privy.	Two Privies.	Three Privies.	Total covered Mid- den.		
		Uncovered.	Covered.												
North - -	294	1,293	247	4	619	328	6	-	953	131	55	2	188	200	4
North-West - -	228	454	48	50	207	117	3	1	328	44	2	-	46	99	4
South - -	323	651	122	51	364	130	5	3	502	70	14	8	92	103	15
East - -	120	981	170	38	594	186	5	-	785	100	35	-	135	39	3
West - -	863	675	119	9	480	90	1	3	574	71	21	2	94	153	7
Central - -	449	621	108	3	295	151	4	3	453	58	16	6	80	219	16
Borough of Darlington - }	2,277	4,675	814	155	2,559	1,002	24	10	3,595	474	143	18	635	813	43

From this table it appears that in December 1890 whilst there were 2,277 water-closets and 155 pan closets in use in the district, there were no less than 5,489 midden privies, of which 4,675 were connected with uncovered middens, as against 814 where the midden was said to be roofed. The total 4,675 uncovered midden privies were connected with 3,595 middens, of which 2,559 were served each by one privy, 1,002 each by two, 24 each by three, and 10 each by four privies. Assuming that these 3,595 middens each possessed the minimum superficial area laid down as obligatory by the byelaws, the aggregate area of the uncovered middens throughout the borough would amount to upwards of an acre and a quarter in extent. At the time of my inspection many of the middens were extremely offensive from the foul liquid nature of their contents. In four instances I made an examination of the drains leading from the middens to the sewers, and in two cases these drains were found to be completely full of a black, stinking, putrid material. Where the privy middens are situated in close yards, they give rise to very serious nuisance. The excrement and refuse from the middens is carted by the Sanitary Authority scavengers to a depôt, whence it is finally disposed of to farmers for agricultural purposes.

Darlington Rural Sanitary District.—Excrement and refuse are disposed of in this district in ordinary midden privies, the ashpits of which are commonly uncovered. The middens, as a rule, are of moderate dimensions, with their floors at, or above the level of the ground surface; they are said not to be drained into the sewers. There are a few waterclosets in the parishes of Middleton St. George, Hurworth-on-Tees, and Cockerton.

Darlington
R.S.D.

The scavenging of middens is effected by the tenants under the supervision of the Inspector of Nuisances, who informed me that he made a practice of visiting each midden twice a year, at times when the farmers were likely to be disengaged, in order to secure cleansing at these periods. It is stated that where the closets are situated near houses, the emptying is effected at shorter intervals. The excrement and refuse are finally disposed of as manure for gardens or land.

Stockton-on-Tees Urban Sanitary District.—About a ninth (1,062) of the houses in this district had been, by 1890, provided with waterclosets. The remaining eight-ninths of the houses have to depend upon midden privies for the disposal of their

Stockton-on-
Tees U.S.D.

Excrement
and Refuse
Disposal.

Stockton-on-
Tees U.S.D.

excrement and refuse. A great majority of the middens are covered, are small in size, and are not connected with the sewers. There are still a number of cases (274 in 1890) where, owing to the want of back passages, the night soil from privies has to be carried through houses. In such cases iron pails have as a rule, been provided.

The scavenging of the middens at the time of my inspection was carried out by a contractor, acting under the Sanitary Authority, who was expected to remove the contents of the middens and tubs at monthly and weekly intervals respectively. The work however, was being very unsatisfactorily performed, and there were many complaints as to the length of time which elapsed between the visits of the scavenger; so that early in 1891 the corporation terminated the contract. The midden contents are sold to farmers for manure.

Stockton
R.S.D.

Stockton Rural Sanitary District.—Throughout this district, with few exceptions (chiefly at Carlton Ironworks) the old fashioned privy middens have been abolished, and the privies in general use are furnished with fixed receptacles, the floors of which are raised above the ground surface. These receptacles are cemented, the size limited to the space beneath the seat, which is hinged to allow of the application of ashes and house refuse to the excreta. At Port Clarence iron pans on the Middlesbrough plan have been substituted for the middens. Excrement and refuse in the villages of Norton, Hartburn, Billingham, Haverton, and Carlton are removed from the middens at fortnightly, and from the pans at weekly intervals, by contractors under the Sanitary Authority. At Port Clarence the emptying of the pans is effected by scavengers employed by the owners of the ironworks. The privy contents are finally disposed of as manure to the farmers in the district.

Middles-
brough
U.S.D.

Middlesbrough Urban Sanitary District.—Excrement and refuse are almost universally disposed of at Middlesbrough in privies of one or another class. Waterclosets are found in the residences of the well-to-do classes only (in 1890 there were only 893 waterclosets in use in the borough). More than half the houses at the time of my inspection had been provided with strong oblong iron boxes for the reception of the excrement, ashes, and all house refuse. These pans are, in fact, movable middens. Such houses as are not provided with waterclosets or pan closets still depend on the privy midden system for the disposal of their excrement and refuse, and many of these are situate in the older parts of the town. Each midden, as a rule, is common to two privies. They are usually roofed, and are said to be rarely connected with the sewers. A considerable number of old middens were noticed during my inspection in which the floor of the midden was from a foot to 18 inches below the ground level. Some of these were also uncovered, and in consequence the midden contents were wet. Some of the worst examples were observed in the back road between Lower East Street and Lower Feversham Street, Union Cottages, Paradise Place, Station Street, Stansfield Street, and Wear Street. In the more modern structures the middens are limited in size, roofed, and with their floors either at or above the surface level. The numbers of each class of closet in Middlesbrough in 1890 were stated to be as follows:—

Pan closets	-	-	-	-	-	7,831
Privies with single ashpits	-	-	-	-	-	741
Middens common to two privies	-	-	-	-	-	2,847
Middens common to three privies	-	-	-	-	-	330
						<hr/>
Total	-	-	-	-	-	11,449
						<hr/>

The scavenging is performed by the Corporation's own servants. The pans are said to be emptied twice a week; both pans and closets are numbered, and the pans on each occasion of emptying are scraped, and dredged over with carbolic powder. The middens are stated to be emptied at intervals of from once a fortnight to once a month; in a few cases once in six weeks. The work of scavenging at the time of my inspection was apparently performed in a very efficient manner. The contents of the pans and midden closets are conveyed in covered carts to an isolated dépôt, where they are partially treated with lime, and afterwards forwarded by rail to farmers living within a radius of 20 miles of Middlesbrough. Rubbish is burnt in a destructor furnace.

South Stockton Urban Sanitary District.—This is essentially a privy midden town, less than 100 water-closets (87 in 1890) being in use. The middens are, as a rule, of small size, roofed over, and unconnected with the sewers. A few large uncovered middens still exist, and in one or two streets off Trafalgar Street the contents of the middens have, owing to want of backways, to be carried through the houses. The midden contents are removed by a contractor under the Sanitary Authority at monthly intervals, and sold by him to farmers in the neighbourhood. All privies built since 1890 have, at the instance of the Sanitary Authority, been so constructed as to comply with the principles laid down in the Board's Model Byelaws.

Ormesby Urban Sanitary District.—Midden privies are in use throughout this district. They were originally constructed so that the floor of the midden was at least 18 inches below the surface level. Each midden is, as a rule, common to two privies, the middens having each a superficial area of 18 feet. During recent years many of the middens have been filled up with ballast to, or slightly above the surface level, and roughly paved with loose bricks. The middens are roofed, and are not connected with the sewers. In a certain number of cases pans on the Middlesbrough plan have been substituted for the middens. At North Ormesby the middens are emptied in rotation about once every four weeks by scavengers in the employment of the Sanitary Authority, and the contents removed by farmers. At South Ormesby the scavenging devolves upon the tenants, and here considerably longer intervals occur between the periods of removal. There were 44 waterclosets in use in this district in 1890.

Ormesby
U.S.D.

Normanby Urban Sanitary District.—About three-fourths of the houses in this district, situate chiefly at South Bank, are said to be provided with pans on the Middlesbrough system, and the remaining fourth, comprising nearly the whole of the houses at Normanby, and a few at South Bank, with midden privies. The midden privies here are similar in character to those described as in use at Ormesby, with the exception that those at Normanby are, as a rule, connected with the sewers. The middens and pans are emptied by contractors under the Sanitary Authority, and under the terms of the contract each pan has to be emptied three times a fortnight, and each midden once a month. The contractor disposes of the night soil and ashes to farmers in the district.

Normanby
U.S.D.

Eston Urban Sanitary District.—In 1890, there were only seven waterclosets in use in this district. The great majority of the houses throughout the district, are provided with pan closets on the Middlesbrough system; the whole of the houses in Grange Town, and in California, and about three-fourths of the houses in South Eston, and two-thirds of those in South Bank, being so supplied. The remaining houses are provided with midden privies, which, in the case of the older houses, are similar in character to those already described as in use in the Ormesby and Normanby Urban Sanitary Districts, whilst those in the newer houses are constructed generally in accordance with the principles of the Board's model byelaws. The scavenging in the Grange Town and South Bank portions of the district is performed by servants of the Sanitary Authority, and the pans are regularly emptied at least once a week. At South Eston the scavenging is performed by contractors under the Sanitary Authority, and the privy middens are here emptied regularly at fortnightly intervals. The work of scavenging at the time of my inspection was performed throughout the whole district in an eminently satisfactory manner. The night soil and ashes are carted away in proper sanitary tumbler carts, and sold to farmers who have land in the district.

Eston U.S.D.

Kirkleatham Urban Sanitary District.—At Coatham, the majority of the houses are provided with waterclosets (upwards of 350 houses in 1890), each furnished with a separate cistern. The remaining houses are provided with midden privies, or with pans on the Middlesbrough system. In two or three instances in Pierson Street, privy middens were observed actually situate immediately beneath bedrooms. At Warrenby privy middens of bad type are in use, and the remarks made by Dr. Thorne Thorne, after his inspection in 1875, to the effect that these structures, which are situate in rows behind the parallel rows of dwelling-houses, "in yards paved with bricks, loosely laid in sand without any intervening mortar or cement," "are unroofed, and hence must become sloppy and offensive, and the brick work of which they are constructed is only $4\frac{1}{2}$ inches in thickness, and even this is put together in so imperfect a manner that soakage through it must take place," have been fully justified. At the time of my inspection soakage had, in many instances,

Kirkleatham
U.S.D.

taken place, and many of the middens were sloppy and offensive. At Dinsdale, Yearby, Kirkleatham, and in some parts of Coatham, the old-fashioned privy middens are in use. The Sanitary Authority employ scavengers for the removal of the contents of the pan closets at weekly intervals, and of the privy middens when the latter are "full." In many parts of the district, especially at Warrenby, considerable accumulations were observed at the time of my visit. The night-soil, ashes, and house refuse are carted to a dépôt, and thence disposed of to farmers who have land in the district.

Summary.—From the foregoing notes it will be clear that as regards excrement and refuse disposal and removal, no such community of circumstance existed in the districts invaded by Enteric Fever as would account for such a sudden and excessive incidence as that which took place. Whether, in the districts affected, excrement disposal was by means of uncovered privy middens of the worst type, as at Darlington, by middens of improved type, as at Stockton-on-Tees, by small covered middens, as in the Stockton Rural District, by pans, as at Eston, or by waterclosets, as at Coatham, all places suffered simultaneously from the epidemic. So, too, in districts where two systems of excrement disposal were in use, as at Middlesbrough, Ormesby, and Normanby, and refuse of this sort was dealt with, partly by means of pans and partly by means of privy middens, the fever indiscriminately invaded houses on both systems. As regards methods of dealing with domestic refuse, the facts are to like effect. In districts provided with pans, these were emptied at weekly or bi-weekly intervals, as at Eston, and at Port Clarence, in the Stockton Rural District, and in parts of Middlesbrough and Normanby; in districts provided with middens, the contents were removed in some instances, once a fortnight, as at Stockton-on-Tees, and South Stockton; in others once a month to once in six weeks, as at Darlington and Middlesbrough; whilst in others a period of some months was allowed to elapse without the middens being emptied, as in villages situate in the Darlington Rural District. Nevertheless, notwithstanding these varied intervals of removal, no marked difference was to be observed in the incidence of the disease on these different places.

And on the other hand, in districts where precisely similar conditions as to excrement disposal and removal existed in their different centres of population, as in the Darlington and Stockton Rural, and in the Ormesby and Kirkleatham Urban Districts, some localities suffered severely, whilst others enjoyed complete immunity from the fever.

Accordingly, taking all these facts into consideration, some set of circumstances other than those connected with the disposal of excrement and refuse, must be sought in explanation of the epidemic dissemination of Enteric Fever with which this report is concerned.

(3.) SEWERAGE AND DRAINAGE.

Darlington Urban Sanitary District.—Darlington has been sewered throughout. The works were completed in 1878-79 by the construction of the main outfall sewer to the irrigation farm. These works cost upwards of 43,000*l.*, exclusive of the cost of a sewage irrigation farm of 320 acres, with its pumping station and other offices. The sewage farm is situate due south of the borough, at a distance of 1½ miles from the market place. The main sewers within the town are constructed of glazed stoneware pipes. The main outfall and intercepting sewer, which follows generally the course of the River Skerne, consists partly of an egg-shaped brick built sewer, and partly of 24-inch pipes. This main sewer is provided with storm-water overflows which discharge into the River Skerne. The main sewers from the various wards of the town, and also from a portion of the village of Cockerton, situate in the Darlington Rural Sanitary District, all converge towards this main intercepting sewer, and discharge into it at various points.

Some of the subsidiary sewers in the older parts of the town are still constructed of "segment tiles," while some brick circular sewers are also in existence. Ventilation is effected by means of manholes with open gratings at the road surface, situate at distances of from 100 to 150 yards apart. As many complaints have been made of the stench coming from these ventilators (no doubt due to the foul liquid discharged through the drains connecting the privy middens with the sewers), some of the ventilators in the north, east, and central wards, have been closed, and, connexions made with factory chimneys. Six Keeling's destructors have also been erected, three in the east ward and one each in the north, north-west, and west wards respectively, with a view to preventing smells from the ventilators. For flushing purposes five Field's automatic flushing tanks have been provided at the highest points of the sewers in the east ward. All dead ends are stated to be flushed regularly at periods

varying from once in three weeks to once a month. Eleven manholes are said to be still in existence provided with deep catchpits, three in the east, three in the north, one in the north-west, and four in the south wards respectively.

House drains chiefly consist of 6-inch glazed pipes not provided with any trap in their passage to the sewers. House waste pipes are almost universally cut off outside the houses and made to discharge over trapped gully gratings. Soil pipes, as a rule, are carried up above the eaves of houses, but in many cases the continuation is of contracted calibre. Instances were observed where a 4-inch pipe was contracted to 2½ inches.

Darlington Rural Sanitary District.—A number of villages in this district are still dependent on the highway drains for the conveyance out of the place of slop water from the houses; but many of the larger villages have been sewered by the Sanitary Authority. As for instance, Blackwell, Hurworth Place, Heighington, and Low Coniscliffe, where the sewage is discharged into tanks; Hurworth-on-Tees and Middleton St. George (Middleton One Row, and Fighting Cocks), where the sewage is treated on land by irrigation; Cockerton where fully half the houses in the village are connected with the sewer system of the Darlington Corporation. Pipe sewers have also been laid at Haughton-le-Skerne and at Brafferton. The public sewers, where constructed by the Sanitary Authority, are well ventilated by means of surface openings, and special arrangements have been made to secure the flushing of the sewers at Hurworth-on-Tees, and at Middleton St. George; but in other villages no such special arrangements have been made.

House drains are, as a rule, constructed of glazed pipes, and house wastes are almost universally cut off outside the house, and made to discharge over trapped gully gratings. There are not many waterclosets in the district, but where they exist the soil pipes are, as a rule, continued upwards above the eaves of the roof.

Stockton-on-Tees Urban Sanitary District.—The whole of the borough of Stockton-on-Tees has been sewered. The sewers in the older parts of the town are stated to be fairly satisfactory, but those for the newly added portion of the borough, situate to the west and north, as well as those for a considerable proportion of the west end ward, were, at the time of my visit, defective. The sewers in the west end district were at that time inadequate to carry off storm water, consequently certain parts of the district, notably the Oxbridge Estate, Light Pipe Hall Road, and Yarm Road, have been liable to flooding during periods of heavy rainfall. A number of houses in these districts were flooded in 1890, and some that I inspected still contained stains of black sewage material that had been washed into them at the time. The sewers for the older part of the borough have nine main outfalls, six into the Tees, and three into the Lustrum Beck. There are also a number of minor outlets of single sewers from streets running at right angles to and abutting upon the river. All the outfalls are said to be furnished with tidal valves. In the Tilery Ward a considerable number of houses drain into a large cesspool, which at the time of my inspection was full of sewage matter, and a source of considerable nuisance to the neighbourhood. The Lustrum Beck, that passes through the newly-added part of the borough and which also for part of its course forms the northern boundary of the borough, can only be regarded as an open sewer, and is a source of considerable nuisance, more especially in the Portrack Ward. The sewers are ventilated by means of manholes with open gratings at the road surface, situate at intervals stated to average 100 yards apart; there are also a number of 6-inch shafts which have been carried up the sides of buildings, and during recent years some six Keeling's "destructors" have been erected. A number of the manholes provided with deep catch-pits are said to be still in existence. Ample means for flushing the sewers have been provided. The house drainage is commonly effected by means of 6-inch glazed pipes. Where slop sinks exist within houses the waste pipes are almost without exception cut off outside the house, and made to discharge either over a trapped gully grating or over a channel leading to a trapped gully grating. A considerable proportion of cottages have no slop sinks indoors, slops, in these cases, being poured down a gully in the yard. Watercloset soil pipes are, as a rule, carried up above the eaves.

Stockton Rural Sanitary District.—All the more populous villages in the Stockton Rural Sanitary District have been sewered by the Sanitary Authority. The sewage of one village, Hartburn, is disposed of by broad irrigation, and at Haverton Hill and Port Clarence sewage is discharged directly into the estuary of the River Tees. The sewage from all other large villages is discharged into tanks, where it undergoes some form of filtration before being passed into streams. At Norton the sewers are apparently fairly well ventilated by means of manholes with gratings at the street

ENTERIC
FEVER IN THE
TEES VALLEY
1890-91; BY
DR. BARRY.

Sewerage
and Drainage

Darlington
U.S.D.

Darlington
R.S.D.

Stockton-on-
Tees U.S.D.

Stockton
R.S.D.

surface, but at Carlton Ironworks, Haverton Hill, Port Clarence, and other villages, the arrangements for sewer ventilation are apparently defective. The means for flushing are inadequate, and in consequence in times of drought much nuisance is stated to arise. House wastes are always cut off outside the houses. Watercloset soil-pipes are carried up above the eaves in their full diameter, and in a number of cases, at the instance of the Medical Officer of Health, a second opening has been provided for the ventilation of the house drains in accordance with the principles of the model byelaws.

Middlesbrough Urban Sanitary District.—The borough of Middlesbrough has been sewered throughout. There are two systems of sewers, one for the part of the town on the north side, the other for the part to the south of the railway. The northern system has two outfalls provided with tidal flaps into the River Tees. The southern system of sewers has one outfall at the extreme eastern end of the borough, likewise into the river. The two systems are connected by means of storm overflows, which have been constructed between the southern main sewer and the northern system. The main sewers are constructed of brick, and the branch sewers, as a rule, of glazed socketed pipes. A number of the older subsidiary sewers are still constructed of "segmental tiles," but pipe sewers are gradually being substituted for these. The manholes in the northern system are nearly all furnished with deep catch-pits, which are stated to be emptied at monthly intervals. In the southern system very few such catch-pits exist. The ventilation of the sewers in the northern part of the town is very defective; there the only means of ventilation for several converging main sewers is by means of a 12-inch brick shaft constructed at the old Town Hall, with an "extractor" at its summit. The southern system and all new sewers are ventilated by means of surface gratings at the manholes, which are situated at intervals of about 200 feet. Where complaints have been made of the smell from ventilators, shafts provided with "extractors" at their summits, have been carried from the sewers up the sides of buildings in the neighbourhood. The flushing of the sewers is effected by means of the sewage pent up by halfdoors in the course of the sewers, and also by means of a portable tank holding about 2,000 gallons. The main and subsidiary sewers are stated to be flushed in this manner four or five times a year, but little flushing of branches and drains in back streets has hitherto been attempted. House drainage is effected by means of 6-inch glazed pipes. Where slop sinks exist within dwellings, the sink pipe in a vast majority of cases is cut off outside the house and made to discharge either over a trapped gully grating, or, in the case of recently built houses, over a channel leading to a trapped gully grating. In some of the older houses the sink wastes still discharge under the grating of the trap. Soil-pipes of waterclosets, where such exist, are, as a rule, carried up above the eaves.

South Stockton Urban Sanitary District.—South Stockton has been sewered throughout during recent years. The sewers are constructed of glazed sanitary pipes, and discharge into the River Tees by nine outfalls provided with tidal flaps. The sewers are well ventilated by means of surface grids placed at intervals of about 100 yards, and at each change of direction and gradient. Arrangements have been made whereby the sewers can be flushed by means of a portable tank, at regular intervals. It is stated that this work is carried out throughout the district in the summer and autumn months every fortnight. House drainage is effected by means of glazed pipes, and all waste pipes and rainwater pipes are cut off from the drains and discharge outside over trapped gully gratings.

Ormesby Urban Sanitary District.—The town of North Ormesby has been sewered throughout with stoneware pipes, which have their outfall into a tidal beck flowing into the Tees. The sewers pass down the back streets and are provided with manholes, having catch-pits at the bottom. The ventilation of the sewers is effected by means of gratings on the top of the manholes, and by a number of 4-inch pipes, carried from the sewers up the sides of buildings. The catch-pits at the bottom of the manholes are said to be cleansed at monthly intervals. Flushing is effected by sending the contents of a 2,100 gallon boiler down each manhole twice a year. The village of South Ormesby is drained by means of a stone highway drain 18 inches square, which has its outfall into a watercourse. No special means for ventilation or for flushing has been provided to the drains in this village. The great majority of the houses in the Ormesby district are unfurnished with slop-sinks inside, but are provided with a sink in the yard. Where slop-sinks exist inside the houses the waste pipes are cut off outside in nearly all cases, and made to discharge over a trapped gully grating.

Normanby Urban Sanitary District.—The South Bank portion of the district has been sewered throughout with stoneware pipes, with an outfall discharging on the foreshore of the Tees, and provided with a tidal flap. The subsidiary sewers are carried up the back streets. Ventilation of the sewers is effected by means of surface gratings in the covers of the manholes, of which there are upwards of 40 in this part of the district. In a few cases, where complaints have been made of smell from these openings, a 6-inch metal pipe carried up the side of a neighbouring building has been substituted. The sewers are said to be flushed four times a year, and the catch-pits which here, as in other districts in the neighbourhood exist in the manholes, are emptied out after each flushing. House drainage is effected by means of glazed pipes; and all waste pipes are cut off outside houses, and made to discharge either over a trapped gully grating, or in the case of houses built within the last few years, over a channel leading to a gully 18 inches distant. The village of Normanby has been pipe sewered throughout, with an outfall into a stream, which for a part of its course forms the boundary between the Eston and Normanby districts and eventually discharges into the Tees. The sewers are ventilated by means of surface grids, and are said to be flushed three or four times a year. The house drainage is similar to that at South Bank.

Eston Urban Sanitary District.—The Grange Town portion of the Eston Urban District was pipe sewered some years ago by the property owners, but at the time of my visit the work had been found to be so defective that the Local Board had decided to re-construct the sewerage, and this work was at the time in progress. The outfall of the Grange Town sewers is on the foreshore of the Tees. The house drains are, like the public sewers, also said to be defective; but each house drain is provided with two gully traps in the yard, one, close to the house, over which the waste-pipe from the sink is discharged, and under the grating of the other, which is situate at the far end of the yard, a pipe from the first-mentioned trap is discharged, and consequently there is little chance of sewer air getting into the houses. The South Bank portion of the district was newly sewered in 1889. The new main sewer is connected with an old main sewer which has its outfall on the foreshore near the Cleveland Salt Works. This sewer has recently been ventilated into the chimney stack of the Cleveland Works with apparent success. The South Bank sewers are flushed from the manholes which are fitted with penstocks and valves for the purpose. South Eston and California have also been pipe-sewered throughout, and here also the sewers have recently been newly constructed, and have an outfall into a tank where the sewage is roughly filtered before being discharged into a neighbouring watercourse. The arrangements for flushing and ventilation are apparently satisfactory. Considerable care seems to have been bestowed in this district in securing the disconnexion of house waste from sewers.

Kirkleatham Urban Sanitary District.—The sewerage of Coatham was effected about 1865. The sewers consist of socketed pipes and discharge by means of two outfalls into the sea. There are about 40 ventilating manholes at various points in the lines of the sewers, and in addition 27 six-inch iron-pipe ventilating shafts have been carried up from the sewers to the top of neighbouring buildings. The Coatham sewers are stated to be flushed daily during the summer, and twice a week during the winter with salt water direct from the salt water mains, a system which the Local Board propose to extend to all sewers in the district. The soil-pipes of waterclosets are occasionally situate within the houses, and although, as a rule, a continuation has been made from the top of the soilpipe to the eaves of the house, in many instances the pipe thus extended can be of little use for ventilation purposes owing to its contracted calibre, or to the bends in its course. Warrenby was sewered about 1870, by means of 9-inch pipes down the back streets discharging into a 12-inch outfall sewer which empties into a watercourse, and thence into the sea. The Warrenby sewers are inadequately ventilated, and the flushing arrangements for this part of the district are unsatisfactory. At Dinsdale, Kirkleatham, and Yearby, drains have been laid which convey the slop water to the nearest watercourse. At outlying farmhouses slop water is conveyed, as a rule, to cesspools. House drainage at Coatham and Warrenby is effected by means of glazed pipes. Slop wastes at Coatham are cut off outside houses, and made to discharge over trapped gully gratings. At Warrenby and Dinsdale there are few, if any, direct connexions of dwellings with the drains, most of the houses being provided with gullies in the yards for the disposal of the house slops.

Summary.—From the foregoing notes, it will be clear that, as with excrement and refuse disposal, so with sewerage and drainage, no such community of circumstance

existed in the districts invaded by Enteric Fever as would account for such a sudden and excessive incidence of the disease as that witnessed. For it has been seen that each Urban District had its own system of sewers; that in some instances, as at South Stockton, at Stockton-on-Tees, and at Coatham, multiple systems of sewers, unconnected with one another, were in use; whilst in other districts, as in the Rural Districts of Stockton and Darlington, and in the Urban Districts of Normanby, Eston, and Kirkleatham, each village and separate centre of population had its own set of sewers, and each set its independent and separate outfall. Further, it has been seen that the greatest variety existed in the method of sewage disposal. In some districts, as at Darlington and Middleton St. George, the sewage was discharged upon land; in others, as at South Stockton, Stockton-on-Tees, and Middlesbrough, the outfall was directly into the river; in others, as at many villages in the Stockton and Darlington Rural Districts, the sewage was discharged into tanks; in others, as at Normanby, South Eston, and Warrenby, it was discharged into watercourses; in others, as at Grange Town and South Bank, it was discharged on the foreshore of the Tees estuary, whilst at Coatham, it was passed directly into the sea. In addition, as regards the house drainage, in every district invaded, with very rare exceptions, complete disconnexion between the sewers and the houses had previously been brought about during recent years. Consequently, taking all these facts into consideration, it is necessary to look to some set of circumstances other than those connected with sewerage and drainage, as having had to do with the epidemic dissemination of Enteric Fever with which this report is concerned.

Water Supply.

(4.) WATER SUPPLY.

Darlington
U.S.D.

Darlington Urban Sanitary District.—With the exception of about 100 houses the whole Borough of Darlington is supplied with water from the River Tees, through the works of the Darlington Corporation. Of the houses not so served, about half are dependent solely upon wells for their water supply. The other half are stated to obtain their drinking water from wells, and to use water from the Darlington Waterworks for washing and trade purposes only.

Darlington
R.S.D.

Darlington Rural Sanitary District.—The great majority of the 2,370 houses situate in this district obtain their water supply from either public or private wells. The public wells, 26 in number, are, as a rule, in good positions, but many of the private wells, as in most other rural districts, are so situate as to be liable to dangerous contamination from drains, privies, or middensteads. In the villages of Cockerton, Blackwell, and Whessoe, 106, 28, and 20 houses respectively are supplied with Tees water through the works of the Darlington Corporation, and in the parish of Middleton St. George (Fighting Cocks and Middleton One Row), 221 and elsewhere 19 houses receive a supply of Tees water through the works of the Stockton and Middlesbrough Water Board.

Stockton-on-
Tees U.S.D.

Stockton-on-Tees Urban Sanitary District.—The whole of the houses in the Borough of Stockton-on-Tees are supplied with Tees water through the works of the Stockton and Middlesbrough Water Board.

Stockton
R.S.D.

Stockton Rural Sanitary District.—At Norton 545 houses, at Haverton Hill 252 houses, in Port Clarence 204 houses, at Hartburn 51 houses, at Elton 11 houses, at Long Newton 9 houses, at Preston 31 houses, at Eaglescliffe Junction 7 houses, at Urray Nook 9 houses, at Eaglescliffe 61 houses, at Billingham 6 houses, and at Carlton Ironworks 155 houses; or 1,335 houses in all, are supplied with water from the Tees through the works of the Stockton and Middlesbrough Water Board. At Carlton Ironworks, however, this water is mixed with water pumped from a deep well. The remaining 918 houses, situate in Wolviston, Billingham, and other villages obtain their supply from wells sunk by the Sanitary Authority in sites not exposed to excremental or sewage pollution. Farm houses, as a rule, are supplied with water from private wells.

Middles-
brough
U.S.D.

Middlesbrough Urban Sanitary District.—The whole of the houses in the Borough of Middlesbrough obtain their water supply from the Tees through the works of the Stockton and Middlesbrough Water Board.

South Stock-
ton U.S.D.

South Stockton Urban Sanitary District.—The whole of the houses in South Stockton are supplied with water from the Tees through the works of the Stockton and Middlesbrough Water Board.

Ormesby
U.S.D.

Ormesby Urban Sanitary District.—At North Ormesby the houses, with some five or six exceptions only, receive their water supply from the Tees through the works of the Stockton and Middlesbrough Water Board. Some five or six houses at North Ormesby and the whole of the houses at South Ormesby and outlying farmhouses, 77 in all, obtain their supply from wells.

Normanby Urban Sanitary District.—At South Bank the whole of the houses obtain their water supply from the Tees through the works of the Stockton and Middlesbrough Water Board, by arrangement with the Normanby Local Board. At the village of Normanby 48 houses are supplied from the Normanby reservoir, which is fed with Tees water received through the mains of the Stockton and Middlesbrough Water Board. The remaining 159 houses in the village obtain their water supply from private wells.

Eston Urban Sanitary District.—The great majority of the houses in the Eston district obtain their water supply from the Tees through the works of the Stockton and Middlesbrough Water Board. The remaining houses, 89 in number, are dependent on private wells.

Kirkleatham Urban Sanitary District.—At Coatham 554 houses, and at Warrenby 153 houses obtain their water supply from the Tees through the works of the Stockton and Middlesbrough Water Board. The remaining 134 houses, situate chiefly at Dinsdale, Kirkleatham, Yearby, and outlying farms, are dependent on wells and streams for their water supply.

Summary.—Hence it appears that as regards water supply the entire Urban Sanitary Districts of Middlesbrough, Stockton-on-Tees, and South Stockton, as well as considerable portions of the Urban Districts of Normanby, Ormesby, Eston, Kirkleatham, with portions of the Rural Sanitary Districts of Stockton and Darlington, obtained their water from the works of the Stockton and Middlesbrough Water Board; whilst the Urban District, and a portion also of the Rural District of Darlington were supplied from the mains of the Darlington Corporation Waterworks. Notwithstanding that the waterworks of the Stockton and Middlesbrough Water Board, and those of the Darlington Corporation are separate and distinct the one from the other, the source of the water is in both instances the same, namely, the River Tees; and the water is obtained at what is practically the same point in that river, the intakes of the two works being situate within a few score yards of one another.

From these notes it will be seen that in the ten Sanitary Districts now under review in which an excessive incidence of Enteric Fever occurred in the two six-week-periods that are in question, there did exist community of circumstance to a large extent as regards water supply, whereas as regards any of the other commonplace conditions which have been elsewhere convicted of disseminating Enteric Fever they differed *inter se* in all variety of ways.

IV.—INCIDENCE OF ENTERIC FEVER ON DISTRICTS (OR PARTS OF DISTRICTS) SUPPLIED WITH WATER FROM THE RIVER TEES, AND ON DISTRICTS (OR PARTS OF DISTRICTS) SUPPLIED FROM OTHER SOURCES.

With a view to ascertaining definitely the extent to which the excessive incidence of Enteric Fever was confined to users of Tees water, as well as to find out if any other districts (besides the ten) within the area of the Tees inquiry, though not suffering fever, shared community of circumstance as regards water supply with the ten districts under review, I obtained from the managers of the respective waterworks the number of houses supplied by them in the several districts within the area of inquiry; and similarly I obtained from other quarters information as to the source of the water supply used by the persons suffering from Enteric Fever within the whole area of inquiry.

The information received from the managers of the waterworks is embodied in Table XXVI., which shows the number of houses at Census, 1891, in each of the 32 Sanitary Districts situate in the area of the Tees inquiry, with their estimated populations* supplied with water from the River Tees, and from other sources respectively.

* As regards certain of these Sanitary Districts wholly supplied with Tees water, namely, Stockton-on-Tees, South Stockton, and Middlesbrough, the number of houses so supplied as furnished by the return of the Water Authority (see Appendix A.) exceeded the total number of houses found at the Census, 1891. In these instances the census figures have been adhered to by me in calculating rate of incidence of Enteric Fever.

In districts partly obtaining, partly not obtaining, Tees water, the number of houses "supplied with other than Tees water" is obtained by deducting the number of houses returned by the Water Authority as "supplied with Tees water" (see Appendix A.) from the total houses found at the Census, 1891. In so far, therefore, as the houses in such districts "obtaining Tees water" have been over-estimated by the Water Authority, the incidence of fever on houses so supplied and on their inhabitants has been under-estimated, and the incidence on other houses and persons overstated in the statistics I adduce.

Detailed information as to the water used by persons suffering from Enteric Fever, prior to their attack, in each of the 32 Sanitary Districts during the period 24th August 1890 to 21st March 1891 (a period embracing the whole of the epidemic incidence), will be found in Appendix B.

TABLE XXVI.

SHOWING, as regards the THIRTY-TWO SANITARY DISTRICTS within the Area of the TEES INQUIRY, the NUMBER of HOUSES and the ESTIMATED POPULATION supplied with WATER from the RIVER TEES and from OTHER SOURCES respectively.

Sanitary District.	Inhabited Houses.			Population.		
	Total Census, 1891.	Supplied with Tees Water.	Supplied with other than Tees Water.	Census, 1891.	Estimated drinking Tees Water.	Estimated drinking other than Tees Water.
1.	2.	3.	4.	5.	6.	7.
Teesdale, R. - - -	3,408	—	3,408	16,622	—	16,622
Barnard Castle, U. - - -	840	—	840	4,341	—	4,341
Auckland, R. - - -	12,217	—	12,217	62,893	—	62,893
Bishop Auckland, U. - - -	1,991	—	1,991	10,527	—	10,527
Shildon and East Thickley, U. - - -	1,978	—	1,978	9,537	—	9,537
Spennymoor, U. - - -	1,135	—	1,135	6,041	—	6,041
Darlington, U. - - -	7,214	7,100	114	38,060	37,458	602
Darlington, R. - - -	2,370	394	1,976	11,452	1,903	9,549
Stockton-on-Tees, U. - - -	8,770	8,770	—	49,731	49,731	—
Stockton, R. - - -	2,253	1,335	918	11,561	7,088	4,873
Sedgefield, R. - - -	3,578	1	3,577	19,559	5	19,554
Hartlepool, U. - - -	3,283	—	3,283	21,521	—	21,521
West Hartlepool, U. - - -	7,502	—	7,502	42,492	—	42,492
Hartlepool, R. - - -	443	—	443	2,654	—	2,654
North's erton, U. - - -	785	—	785	3,802	—	3,802
North's erton, R. - - -	1,674	—	1,674	7,470	—	7,470
Stokesley, R. - - -	2,442	378	2,064	11,119	1,721	9,398
Middlesbrough, U. - - -	13,306	13,306	—	75,516	75,516	—
South Stockton, U. - - -	2,696	2,696	—	15,476	15,476	—
Ormesby, U. - - -	1,558	1,481	77	8,629	8,203	426
Normanby, U. - - -	1,654	1,485	159	9,128	8,250	878
Eston, U. - - -	1,924	1,835	89	10,695	10,200	495
Middlesbrough, R. - - -	331	31	300	1,769	166	1,603
Kirkleatham, U. - - -	841	707	134	4,209	3,538	671
Redcar, U. - - -	584	—	584	2,818	—	2,818
Guisbrough, U. - - -	1,137	—	1,137	5,623	—	5,623
Skelton and Brotton, U. - - -	2,319	—	2,319	11,842	—	11,842
Saltburn-by-the-Sea, U. - - -	442	—	442	2,232	—	2,232
Loftus, U. - - -	1,275	—	1,275	6,208	—	6,208
Guisbrough, R. - - -	1,441	37	1,404	7,054	180	6,874
Richmond, U. - - -	800	—	800	4,216	—	4,216
Richmond, R. - - -	1,783	—	1,783	8,419	—	8,419
Totals - - -	93,974	39,566	54,408	503,616	219,435	284,181

From this table it appears that in the whole area of inquiry nearly 40,000 houses, having an estimated population of 219,435 persons, obtained their water supply from the River Tees, whilst upwards of 54,000 houses, having an estimated population of 284,181 persons, were supplied from other sources than the River Tees.

Attacks.

In Table XXVII. I have distributed the number of cases of Enteric Fever reported to have occurred, fortnight by fortnight, in 32 Sanitary Districts comprised within the area of inquiry during the 32 fortnights ended March 21st 1891, in accordance with the water supply. Part (a) of the table gives the cases which occurred amongst users of Tees water, and Part (b) those amongst persons obtaining their water supply from other sources than the Tees. The table corresponds with Tables I. and VII. where the same cases were distributed according to the Registration and Sanitary Districts in which they occurred respectively.

The facts contained in Table XXVII. as regards Enteric Fever attacks amongst users and non-users of Tees water have been summarised in another Table (XXVIII.) rateably to population in the same manner that the facts as regards Enteric Fever attacks in the Registration and in the Sanitary Districts, were summarised in Tables III. and IX. respectively.

SHOWING, Fortnight by Fortnight the NUMBER of PERSONS reported to have suffered from ENTERIC FEVER ATTACK who obtained their WATER SUPPLY from the RIVER TEES.

Sanitary District.		Popu- lation.	Number of Enteric Fever attacks reported to have occurred during Fortnights ended																																		Total Enteric Fever Attacks reported during Period	
			1890.																																			
			11 January.	25 January.	8 February.	22 February.	8 March.	22 March.	5 April.	19 April.	3 May.	17 May.	31 May.	14 June.	28 June.	12 July.	26 July.	9 August.	23 August.	6 September.	20 September.	4 October.	18 October.	1 November.	15 November.	29 November.	13 December.	27 December.	10 January.	24 January.	7 February.	21 February.	7 March.	21 March.				
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.	32.	33.	34.	35.	36.	37.	38.	
Darlington, U. (part of).	37,458	1	4	1	7	4	2	1	2	-	4	3	-	-	2	-	-	-	2	53	45	24	-4	6	6	3	5	27	12	11	3	6	4	242	172	122	50	
Darlington, R. (part of).	1,903	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	4	4	2	-	-	3	1	1	6	6	1	2	1	-	33	23	10	13	
Stockton-on-Tees, U. -	49,731	5	11	10	11	11	13	12	7	4	7	4	5	8	4	6	6	3	12	50	62	57	31	16	17	11	15	86	50	46	19	13	11	623	351	169	182	
Stockton, R. (part of)	7,088	-	-	-	-	1	-	1	1	3	-	1	-	-	-	-	1	1	3	6	12	22	8	3	3	9	11	7	8	2	2	4	1	110	57	40	17	
Sedgefield, R. (part of)	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Stokesley, R. (part of)	1,721	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	1	1	-	1	-	-	5	4	2	2		
Middlesbrough, U. -	75,516	4	20	8	17	21	16	19	4	1	4	10	10	10	5	8	8	23	10	74	94	70	49	40	26	17	29	121	74	32	36	22	23	905	465	238	227	
South Stockton, U. -	15,476	5	4	11	9	6	6	4	-	2	3	-	-	2	5	3	1	-	8	13	18	9	13	5	3	-	12	25	17	7	9	4	4	208	89	40	49	
Ormesby, U. (part of)	8,203	-	-	1	1	1	1	1	1	-	2	5	2	1	-	1	-	-	3	9	11	5	4	2	1	3	4	9	8	6	3	-	1	85	48	25	23	
Normanby, U. (part of)	8,250	1	1	1	2	3	1	1	2	-	-	-	-	1	-	-	-	-	1	12	20	9	3	4	1	-	-	15	-	10	-	1	1	90	66	41	25	
Easton, U. (part of) -	10,200	-	3	4	5	5	2	1	1	5	2	3	-	1	1	1	2	1	1	6	21	5	7	4	2	-	6	11	2	1	8	7	1	118	46	52	14	
Middlesbrough, R. (part of).	166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-		
Kirkleatham, U (part of).	3,558	1	-	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	6	1	-	1	-	-	3	4	6	2	2	-	20	20	8	12		
Guisborough, R. (part of).	180	1	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	4	2	2	-		
Totals	219,435	18	43	37	53	51	42	40	18	16	22	26	17	23	17	19	18	28	40	229	294	206	119	81	62	44	87	312	183	119	84	59	46	2,453	1,343	729	614	
Fortnightly Attack Rates from Enteric Fever per 10,000 of the Population		0.8	2.0	1.7	2.4	2.5	1.9	1.8	1.8	0.7	1.0	1.2	0.8	1.0	0.8	0.9	0.8	1.3	1.8	10.5	13.1	9.4	5.1	3.7	2.8	2.0	4.0	41.2	8.2	5.1	3.8	2.7	2.1					

Fortnightly Attack Rates
Enteric Fever per
10,000 of the Population

ENTERIC
FEVER IN THE
TEES VALLEY
1890-91; BY
DR. BARRY.

The Fever
in relation to
Water Supply
Attacks.

TABLE XXVII. (b.)

ENTERIC FEVER ATTACKS amongst PERSONS receiving their WATER SUPPLY from SOURCES other than the RIVER TEES.

Sanitary District.		Popu- lation.	Number of Enteric Fever Attacks reported to have occurred during Fortnights ended																								Total Enteric Fever Attacks reported during										
			1890.												1891.												First 6 Weeks' Period ended 18 October 1890.	Second Six Weeks' ended 7 February 1891.									
			11 January.	25 January.	8 February.	22 February.	8 March.	22 March.	5 April.	19 April.	3 May.	17 May.	31 May.	14 June.	28 June.	12 July.	26 July.	9 August.	23 August.	6 September.	20 September.	4 October.	18 October.	1 November.	15 November.	29 November.			13 December.	27 December.	10 January.	24 January.	7 February.	21 February.	7 March.	21 March.	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.	32.	33.	34.	35.	36.	37.	38.
Teesdale, R.	16,622	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Barnard Castle, U.	4,341	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Auckland, R.	62,893	1	1	1	3	-	1	-	-	-	1	-	1	1	-	3	1	1	1	1	1	4	-	-	-	-	-	1	1	2	-	-	-	-	-	-	
Bishop Auckland, U.	10,527	2	-	1	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-	-	4	2	-	-	-	1	3	2	-	-	-	-	-	-	-	-	
Shildon and East Thickley, U.	9,537	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1	-	-	-	1	-	2	-	-	-	-	1	-	-	-		
Spennymoor, U.	6,041	3	1	5	1	-	-	-	-	1	2	-	-	-	-	-	-	1	1	1	1	1	-	-	-	-	-	-	1	-	-	-	-	-	-		
Darlington, U. (part of).	602*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	2	4	-	2	-	-	-	-	-	-	-	-	-	-	-	-		
Darlington, R. (part of).	9,549*	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Stockton, R. (part of).	4,873*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	1	1	-	-	-	-	-	-		
Sedgefield, R. (part of).	19,554	1	1	2	1	-	1	1	-	-	-	-	-	-	1	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Hartlepool, U.	21,521	-	-	-	-	-	-	-	-	-	-	2	2	1	5	5	2	2	1	3	2	2	3	3	2	1	1	-	1	2	1	1	5	-	-		
West Hartlepool, U.	42,492	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Hartlepool, R.	2,654	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Northallerton, U.	3,802	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Northallerton, R.	7,470	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Stokesley, R. (part of).	9,398*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Ormesby, U. (part of).	426*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Normanby, U. (part of).	878*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Easton, U. (part of)	495*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Middlesbrough, R. (part of).	1,693*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Kirkcubbin, U. (part of).	671*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Redcar, U.	2,818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Guisebrough, U.	5,623	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Skelton, U. and Brolton, U.	11,812	-	-	5	1	-	-	-	2	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Salterburn - by - the Sea, U.	2,292	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Loftus, U.	6,208	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Guisebrough, R.	6,874*	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Richmond, U. (part of).	4,216	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Richmond, R.	8,419	-	-	-	-	-	-	3	1	-	-	-	-	-	-	-	-	-	-	-	-	-															

TABLE XXVIII.

*The Fever
in relation to
Water Supply.*

Sanitary District, or Part of Sanitary District.		Attacks per 10,000 Population in each instance.				Attacks.
		16 Months (January 1890, to March 1891).	Two Periods each of Six Weeks collectively.	First Six Week Period (7th Sept.- 18th Oct. 1890).	Second Six Week Period (28 Dec. 1890-7 Feb. 1891).	
PERSONS USING TEES WATER.	DARLINGTON, U. (part of)	64·6	45·9	32·6	13·3	} 28
	DARLINGTON, R. (part of)	173·3	121·0	52·6	68·4	
	STOCKTON-ON-TEES, U.	125·4	70·6	34·0	36·6	
	STOCKTON, R. (part of)	155·4	80·5	56·5	24·0	
	SEDFIELD, R. (part of)	*0·0	0·0	0·0	0·0	
	STOKESLEY, R. (part of)	29·1	23·2	11·6	11·6	
	MIDDLESBROUGH, U.	120·0	61·6	31·5	30·1	
	SOUTH STOCKTON, U.	134·0	57·5	25·8	31·7	
	ORMESBY, U. (part of)	103·7	58·5	30·5	28·0	
	NORMANBY, U. (part of)	109·1	80·0	49·7	30·3	
	ESTON, U. (part of)	115·6	45·1	31·4	13·7	
	MIDDLESBROUGH, R. (part of)	*60·2	0·0	0·0	0·0	
	KIRKLEATHAM, U. (part of)	81·9	56·5	22·6	33·9	
	GUISBROUGH, R. (part of)	*222·0	*111·0	*111·0	0·0	
PERSONS NOT USING TEES WATER.	Teesdale, R.	1·8	1·8	0·6	1·2	} 1
	Barnard Castle, U.	6·9	4·6	4·6	0·0	
	Auckland, R.	9·2	6·0	5·2	0·8	
	Bishop Auckland, U.	15·2	5·7	5·7	0·0	
	Sildon and East Thicklely, U.	6·3	1·0	1·0	0·0	
	Spennymoor, U.	33·2	5·0	3·3	1·7	
	Darlington, U. (part of)	*59·8	*33·2	*33·2	0·0	
	Darlington, R. (part of)	14·7	7·3	6·3	1·0	
	Stockton, R. (part of)	10·3	4·1	0·0	4·1	
	Sedgfield, R. (part of)	5·1	1·0	1·0	0·0	
	Hartlepool, U.	23·2	5·1	3·2	1·9	
	West Hartlepool, U.	16·9	5·9	4·0	1·9	
	Hartlepool, R.	0·0	0·0	0·0	0·0	
	Northallerton, U.	5·3	0·0	0·0	0·0	
	Northallerton, R.	1·3	1·3	1·3	0·0	
	Stokesley, R. (part of)	3·2	1·1	0·0	1·1	
	Ormesby, U. (part of)	211·0	0·0	0·0	0·0	
	Normanby, U. (part of)	*34·1	*22·8	*22·8	0·0	
	ESTON, U. (part of)	*40·4	*40·4	*40·4	0·0	
	Middlesbrough, R. (part of)	0·0	0·0	0·0	0·0	
	Kirkleatham, U. (part of)	0·0	0·0	0·0	0·0	
	Redcar, U.	7·1	3·6	0·0	3·6	
	Guisbrough, U.	0·0	0·0	0·0	0·0	
	Skelton and Brotton, U.	16·0	7·6	5·9	1·7	
	Saltburn-by-the-Sea, U.	0·0	0·0	0·0	0·0	
	Loftus, U.	3·2	0·0	0·0	0·0	
	Guisbrough, R. (part of)	2·9	0·0	0·0	0·0	
	Richmond, U.	7·1	2·4	2·4	0·0	
	Richmond, R.	9·5	1·2	1·0	0·0	

* Rates in each instance based on exceptionally small figures.

From a consideration of these tables it will be found that, putting aside two or three instances in which the numbers are so small as to give unreliable rates, this further sub-division of the districts suffices to demonstrate exceptional incidence of Enteric Fever attack as practically confined to the users of Tees water. Thus, contrasting the attack rate from Enteric Fever per 10,000 population in the total districts and parts of districts using Tees water with that observed in the total districts and parts of districts not using such water, the following ratios are obtained:—

In the six-week-period, 7th September to 18th October 1890, non-users, 1; users, 11.

In the six-week-period, 28th December 1890 to 7th February 1891, non-users, 1; users, 28.

In the two periods taken together, non-users, 1; users, 15.

Attacks.

Not the least important outcome of this contrast is the circumstance that the disproportion between attack of users and non-users of Tees water was greatest in the six-weeks, 28th December 1890 to 7th February 1891; at a time, that is, when Enteric Fever is unapt to become epidemic in this country.

Further this sub-division of the districts has also brought to light similar differences *within the limits of single districts* of incidence of fever on users and non-users of Tees water. For example: the attack rate from Enteric Fever in the Darlington Rural Sanitary District, as a whole, during the two periods of six-weeks (7th September to 18th October 1890, and 28th December 1890 to 7th February 1891), taken collectively, was 26 per 10,000, whereas it amounted to not less than 121 per 10,000 amongst persons supplied with Tees water. In like manner the Enteric Fever attack rate was 49 per 10,000, during the same period in the Stockton Rural Sanitary District, as a whole, whereas, amongst users of Tees water in that district, the attack rate was 80 per 10,000. And as regards the Stokesley and Guisbrough Rural Sanitary Districts, which, when taken, as a whole, did not show any excessive incidence of Enteric Fever, it has to be noted that fever occurred only in the villages (Yarm, in Stokesley, and Low Lackenby, in Guisbrough), which were supplied with Tees water.

This different behaviour of Enteric Fever amongst users and non-users of Tees water respectively in the area of the Tees inquiry during the 32 fortnights ended 21st March 1891, is illustrated, fortnight by fortnight, in the annexed Diagram V. And the distribution according to the source of water supply, of the houses invaded in the 32 Sanitary Districts within the whole area of inquiry, is further illustrated, fortnight by fortnight, during the 16 fortnights ended 21st March 1891 in the dotted Maps XV. to XXIX. In these maps the approximate number of houses in the several areas is indicated by circles of varying size.

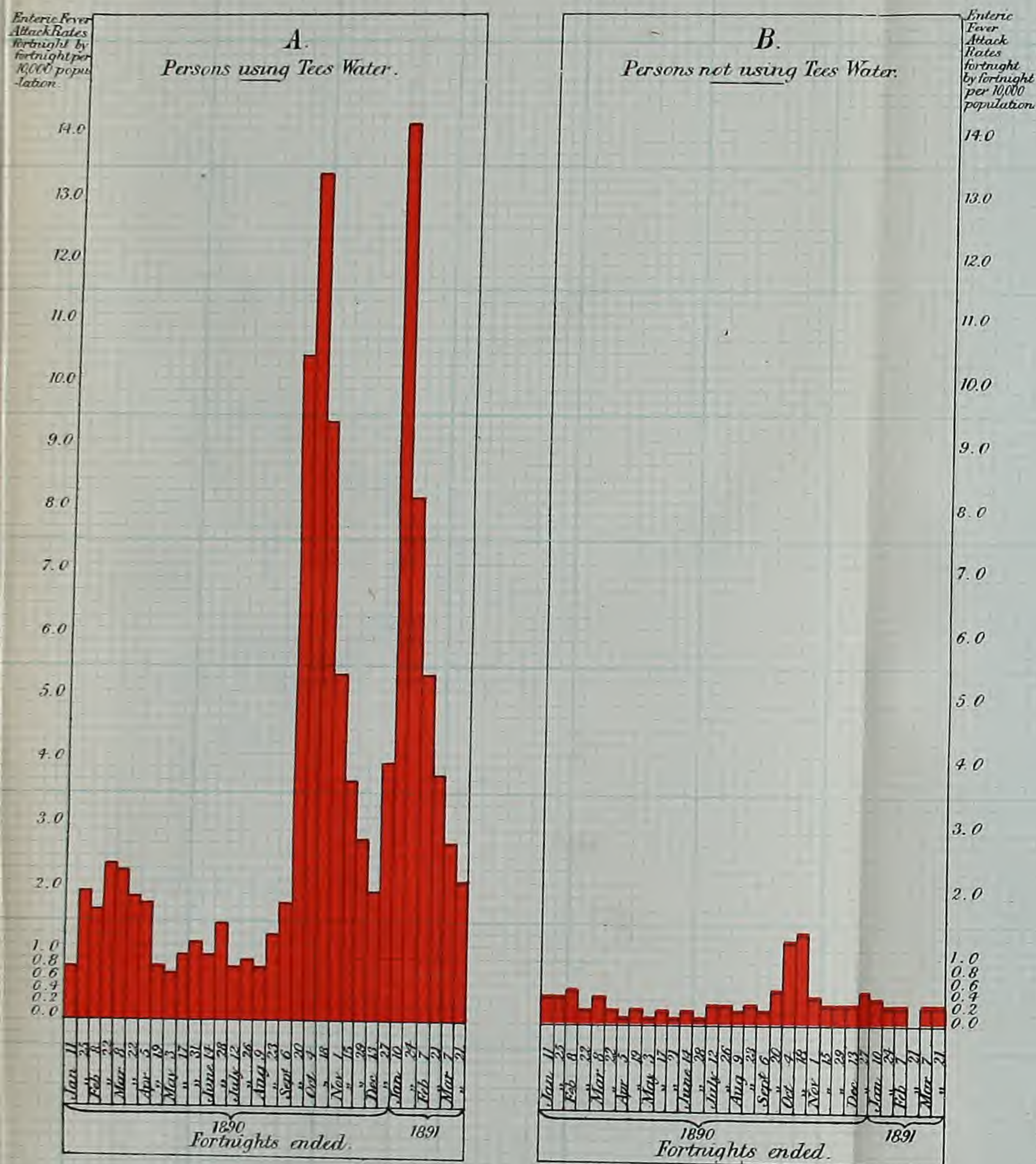
Mortality.

Again checking the above data respecting fever *attack* by the facts as regards fever *mortality*, the fever deaths have in Table XXIX. been distributed in the 32 Sanitary Districts during the 52 weeks ended 27th June 1891, in accordance with the water supply. Part (a) of the Table gives the deaths which occurred amongst users of the Tees water, and Part (b), those amongst persons obtaining their water supply from other sources than the Tees. This Table corresponds with Tables IV. and X., where the deaths were distributed according to the Registration and Sanitary Districts in which they occurred respectively.

The facts contained in Table XXIX., as regards Enteric Fever *mortality* amongst users and non-users of Tees water have been summarised in the following Table XXX., rateably to population in the same manner that the facts as regards Enteric Fever deaths in the Registration and in the Sanitary Districts were summarised in Tables V. and IX. respectively.

DIAGRAM V.

Showing—A, for Persons using Tees Water and B, for Persons not using Tees Water within the area of the Tees Inquiry;—the Attack Rate, per 10,000 living in each class, from Enteric Fever fortnight by fortnight from January 1890 to March 1891.





References.

- I Teesdale rural Sanitary district
II Auckland
III Sedgfield
IV Hartlepool
V Darlington
VI Stockton
VII Middlesbrough
VIII Guisborough
IX Stokesley
X Northallerton
XI Richmond
1 Spennymoor Urban
2 Bishop Auckland
3 Shildon
4 Barnard Castle
5 Darlington
6 Hartlepool
7 West Hartlepool
8 Stockton on Tees
9 South Stockton
10 Middlesbrough
11 Ormesby
12 Normanby
13 Eston
14 Kirkcubright
15 Redcar
16 Guisborough
17 Skelton & Brotton
18 Saltburn by the Sea
19 Loftus
20 Northallerton
21 Richmond

- Villages containing under 50 Houses
From 50 to 100 Houses
100 to 250 Houses
250 to 500 Houses
Towns
500 to 1000 Houses
1000 to 2500 Houses
2500 to 5000 Houses
5000 to 10000 Houses
upwards of 10000 Houses



- Boundaries of Urban Sanitary Districts
Boundaries of Registration Districts
Towns or Villages supplied with water from River Tees
Houses supplied with Tees Water invaded by Enteric Fever during the fortnight ended September 6th 1890.
Houses supplied from other sources than River Tees invaded by Enteric Fever during the fortnight ended September 6th 1890.
+ Houses invaded after removal to them of persons from Tees districts

References.

- I Teesdale rural Sanitary district
II Auckland
III Sedgfield
IV Hartlepool
V Darlington
VI Stockton
VII Middlesbrough
VIII Guisborough
IX Stokesley
X Northallerton
XI Richmond
1 Spennymoor Urban
2 Bishop Auckland
3 Shildon
4 Barnard Castle
5 Darlington
6 Hartlepool
7 West Hartlepool
8 Stockton on Tees
9 South Stockton
10 Middlesbrough
11 Ormesby
12 Normanby
13 Eton
14 Kirkcubright
15 Redcar
16 Guisborough
17 Skelton & Brotton
18 Saltburn by the Sea
19 Loftus
20 Northallerton
21 Richmond

- Villages containing under 50 Houses
From 50 to 100 Houses
100 to 250 Houses
250 to 500 Houses
Towns 500 to 1000 Houses
1000 to 2500 Houses
2500 to 5000 Houses
5000 to 10000 Houses
upwards of 10000 Houses



References.

- I Teesdale rural Sanitary district
II Auckland
III Sedgfield
IV Hartlepool
V Darlington
VI Stockton
VII Middlesbrough
VIII Guisborough
IX Stokesley
X Northallerton
XI Richmond
1 Spennymoor Urban
2 Bishop Auckland
3 Shildon
4 Barnard Castle
5 Darlington
6 Hartlepool
7 West Hartlepool
8 Stockton on Tees
9 South Stockton
10 Middlesbrough
11 Ormesby
12 Normanby
13 Eton
14 Kirkcubright
15 Redcar
16 Guisborough
17 Skelton & Brotton
18 Saltburn by the Sea
19 Loftus
20 Northallerton
21 Richmond

- Villages containing under 50 Houses
from 50 to 100 Houses
100 to 250 Houses
250 to 500 Houses
Towns
500 to 1000 Houses
1000 to 2500 Houses
2500 to 5000 Houses
5000 to 10000 Houses
upwards of 10000 Houses



MAP XVII.

DIAGRAM MAP
SHEWING THE

REGISTRATION & SANITARY DISTRICTS.

With the position of the principal Towns and Villages
included therein situate immediately to the

NORTH & SOUTH OF THE RIVER TEES.

Scale 4 miles to 1 inch.

- Boundaries of Urban Sanitary Districts.
Boundaries of Registration Districts.
Towns or Villages supplied with water from River Tees
Houses supplied with Tees Water invaded by Enteric Fever during the fortnight ended October 4th 1890.
Houses supplied from other sources than River Tees invaded by Enteric Fever during the fortnight ended October 4th 1890.
Houses invaded after removal to them or persons from Tees districts



References.

- I Teesdale rural Sanitary district
II Auckland
III Sedgefield
IV Hartlepool
V Darlington
VI Stockton
VII Middlesbrough
VIII Guisborough
IX Stokesley
X Northallerton
XI Richmond
1 Spennymoor Urban
2 Bishop Auckland
3 Shildon
4 Barnard Castle
5 Darlington
6 Hartlepool
7 West Hartlepool
8 Stockton on Tees
9 South Stockton
10 Middlesbrough
11 Ormesby
12 Normanby
13 Eton
14 Kirkleatham
15 Redcar
16 Guisborough
17 Skelton & Brotton
18 Saltburn by the Sea
19 Loftus
20 Northallerton
21 Richmond

- Villages containing under 50 Houses
From 50 to 100 Houses
100 to 250 Houses
250 to 500 Houses
Towns
500 to 1000 Houses
1000 to 2500 Houses
2500 to 5000 Houses
5000 to 10000 Houses
upwards of 10000 Houses



MAP XVIII.
DIAGRAM MAP
SHEWING THE
REGISTRATION & SANITARY DISTRICTS.
With the position of the principal Towns and Villages
included therein situate immediately to the
NORTH & SOUTH OF THE RIVER TEES.

Scale 4 miles to 1 inch.

- Boundaries of Urban Sanitary Districts.
Boundaries of Registration Districts.
Towns or Villages supplied with water from River Tees
Houses supplied with Tees Water invaded by Enteric Fever during the fortnight ended, October 18th 1890
Houses supplied from other sources than River Tees invaded by Enteric Fever during the fortnight ended, October 18th 1890
Houses invaded after removal to them of persons from Tees districts

References.

- I Teesdale rural Sanitary district.
- II Auckland
- III Selgiefeld
- IV Hartlepool
- V Darlington
- VI Stockton
- VII Middlesbrough
- VIII Guisborough
- IX Stokesley
- X Northallerton
- XI Richmond
- 1 Spennymoor Urban
- 2 Bishop Auckland
- 3 Shildon
- 4 Barnard Castle
- 5 Darlington
- 6 Hartlepool
- 7 West Hartlepool
- 8 Stockton on Tees
- 9 South Stockton
- 10 Middlesbrough
- 11 Ormesby
- 12 Normanby
- 13 Eton
- 14 Kirkcubbin
- 15 Redcar
- 16 Guisborough
- 17 Skelton & Brotton
- 18 Saltburn by the Sea
- 19 Loftus
- 20 Northallerton
- 21 Richmond

- Villages containing under 50 Houses
- From 50 to 100 Houses
- 100 to 250 Houses
- 250 to 500 Houses
- Towns
- 500 to 1000 Houses
- 1000 to 2500 Houses
- 2500 to 5000 Houses
- 5000 to 10000 Houses
- upwards of 10000 Houses



- Boundaries of Urban Sanitary Districts.
- Boundaries of Registration Districts.
- Towns or Villages supplied with water from River Tees
- Houses supplied with Tees Water invaded by Enteric Fever during the fortnight ended November 1st 1890.
- Houses supplied from other sources than River Tees invaded by Enteric Fever during the fortnight ended November 1st 1890.
- Houses invaded after removal to them of persons from Tees districts

References.

- I Teesdale rural Sanitary district
II Auckland
III Sedgfield
IV Hartlepool
V Darlington
VI Stockton
VII Middlesbrough
VIII Guisborough
IX Stokesley
X Northallerton
XI Richmond
1 Spennymoor Urban
2 Bishop Auckland
3 Shildon
4 Barnard Castle
5 Darlington
6 Hartlepool
7 West Hartlepool
8 Stockton on Tees
9 South Stockton
10 Middlesbrough
11 Ormesby
12 Normanby
13 Eton
14 Kirkcubbin
15 Reicar
16 Guisborough
17 Skelton & Brotton
18 Saltburn by the Sea
19 Loftus
20 Northallerton
21 Richmond

- Villages containing under 50 Houses
from 50 to 100 Houses
100 to 250 Houses
250 to 500 Houses
Towns
500 to 1000 Houses
1000 to 2500 Houses
2500 to 5000 Houses
5000 to 10000 Houses
upwards of 10000 Houses



MAP XX.

DIAGRAM MAP
SHEWING THE

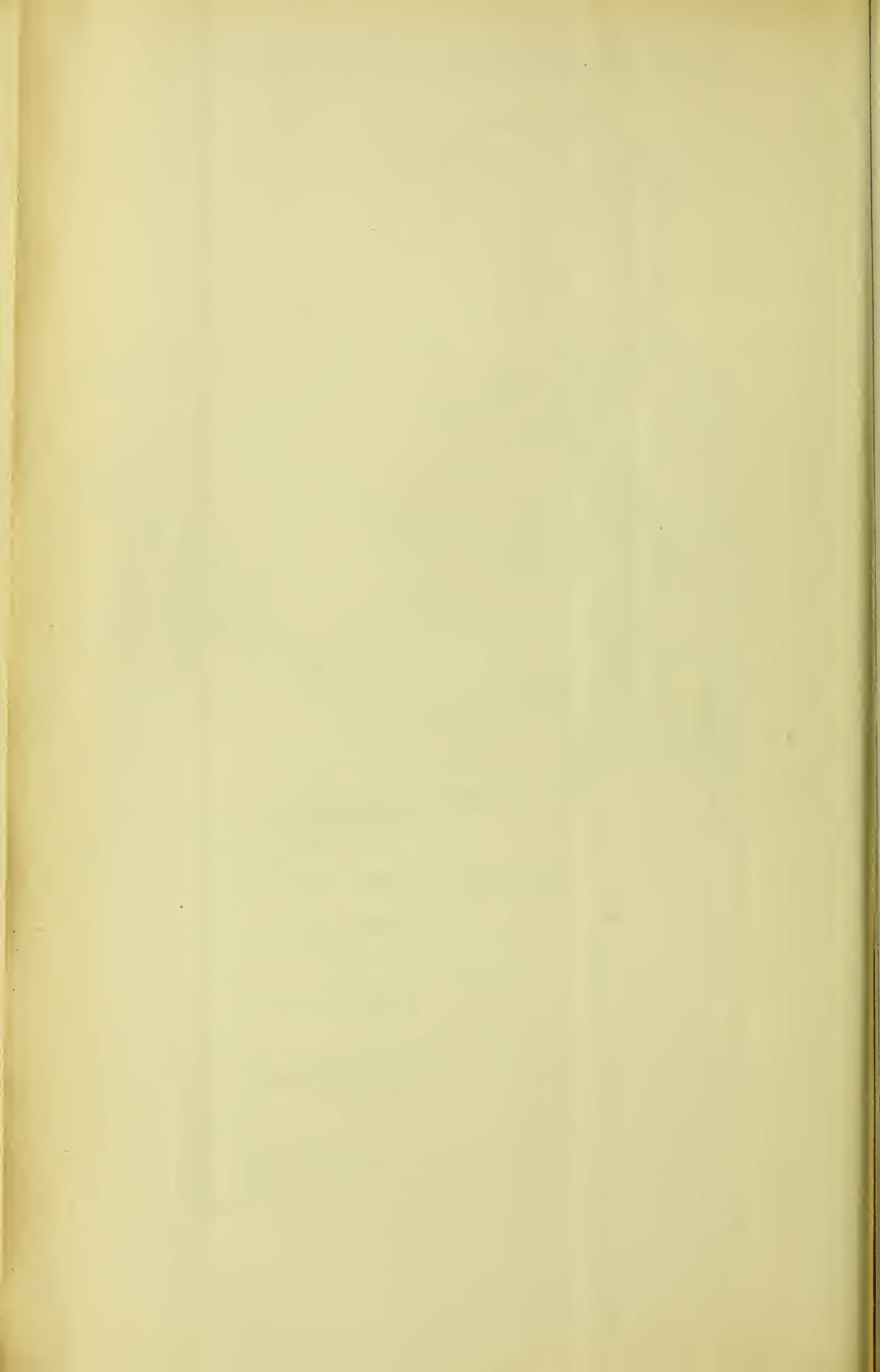
REGISTRATION & SANITARY DISTRICTS.

With the position of the principal Towns and Villages
included therein situate immediately to the

NORTH & SOUTH OF THE RIVER TEES.

Scale 4 miles to 1 inch.

- Boundaries of Urban Sanitary Districts.
Boundaries of Registration Districts.
Towns or Villages supplied with water from River Tees.
Houses supplied with Tees Water invaded by Enteric Fever during the fortnight ended November 15th 1890.
Houses supplied from other sources than River Tees invaded by Enteric Fever during the fortnight ended November 15th 1890.
Houses invaded after removal to them of persons from Tees districts.



References.

- I Teesdale rural Sanitary district
II Auckland
III Sedgfield
IV Hartlepool
V Darlington
VI Stockton
VII Middlesbrough
VIII Guisborough
IX Stokesley
X Northallerton
XI Richmond
1 Spennymoor Urban
2 Bishop Auckland
3 Shildon
4 Barnard Castle
5 Darlington
6 Hartlepool
7 West Hartlepool
8 Stockton on Tees
9 South Stockton
10 Middlesbrough
11 Ormesby
12 Normanby
13 Eton
14 Kirkcubright
15 Redcar
16 Guisborough
17 Skelton & Brotton
18 Saltburn by the Sea
19 Loftus
20 Northallerton
21 Richmond

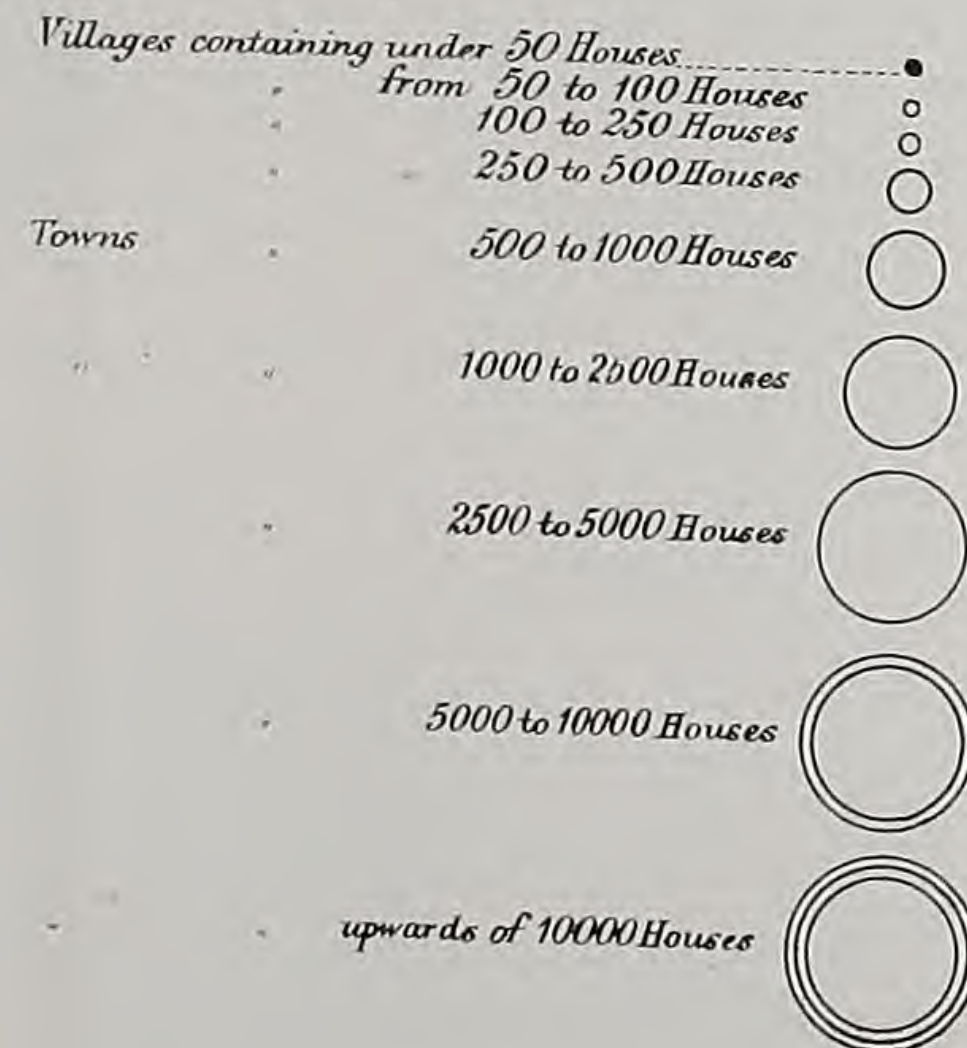
- Villages containing under 50 Houses
From 50 to 100 Houses
100 to 250 Houses
250 to 500 Houses
Towns
500 to 1000 Houses
1000 to 2500 Houses
2500 to 5000 Houses
5000 to 10000 Houses
upwards of 10000 Houses



- Boundaries of Urban Sanitary Districts
Boundaries of Registration Districts
Towns or Villages supplied with water from River Tees
Houses supplied with Tees Water invaded by Enteric Fever during the fortnight ended November 29th 1890.
Houses supplied from other sources than River Tees invaded by Enteric Fever during the fortnight ended November 29th 1890.
Houses invaded after removal to them or persons from Tees districts

References.

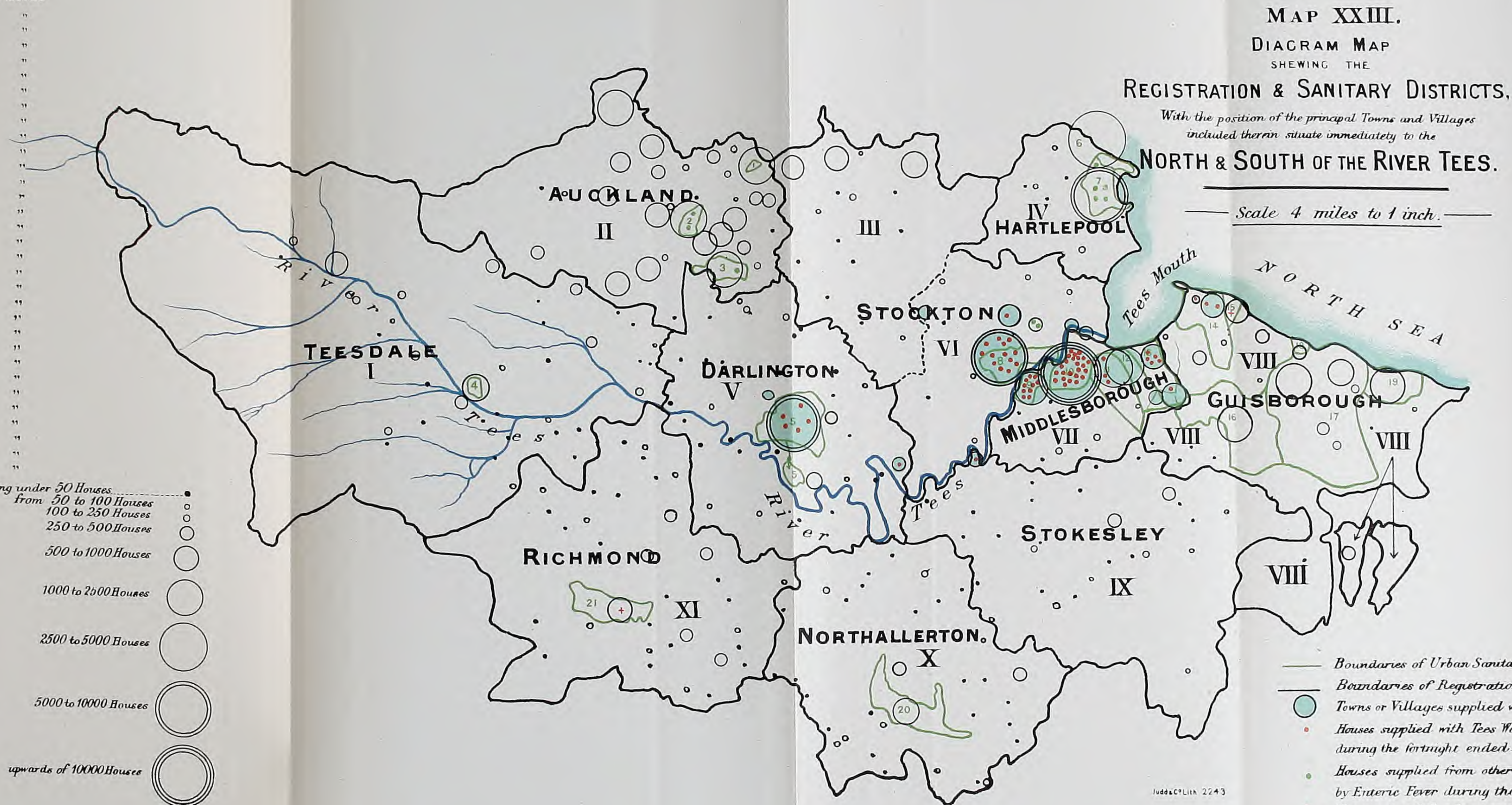
- I Teesdale rural Sanitary district
 II Auckland
 III Sedgefield
 IV Hartlepool
 V Darlington
 VI Stockton
 VII Middlesbrough
 VIII Guisborough
 IX Stokesley
 X Northallerton
 XI Richmond
 1 Spennymoor Urban
 2 Bishop Auckland
 3 Shildon
 4 Barnard Castle
 5 Darlington
 6 Hartlepool
 7 West Hartlepool
 8 Stockton on Tees
 9 South Stockton
 10 Middlesbrough
 11 Ormesby
 12 Normanby
 13 Eton
 14 Kirkcubbin
 15 Redcar
 16 Guisborough
 17 Skelton & Brotton
 18 Saltburn by the Sea
 19 Loftus
 20 Northallerton
 21 Richmond



References.

- I Teesdale rural Sanitary district
II Auckland
III Sedgfield
IV Hartlepool
V Darlington
VI Stockton
VII Middlesbrough
VIII Guisborough
IX Stokesley
X Northallerton
XI Richmond
1 Spennymoor Urban
2 Bishop Auckland
3 Shildon
4 Barnard Castle
5 Darlington
6 Hartlepool
7 West Hartlepool
8 Stockton on Tees
9 South Stockton
10 Middlesbrough
11 Ormesby
12 Normanby
13 Eton
14 Kirkcubright
15 Redcar
16 Guisborough
17 Skelton & Brotton
18 Saltham by the Sea
19 Loftus
20 Northallerton
21 Richmond

- Villages containing under 50 Houses
from 50 to 100 Houses
100 to 250 Houses
250 to 500 Houses
Towns
500 to 1000 Houses
1000 to 2500 Houses
2500 to 5000 Houses
5000 to 10000 Houses
upwards of 10000 Houses



- Boundaries of Urban Sanitary Districts
Boundaries of Registration Districts
Towns or Villages supplied with water from River Tees
Houses supplied with Tees Water invaded by Enteric Fever during the fortnight ended December 27th 1890.
Houses supplied from other sources than River Tees invaded by Enteric Fever during the fortnight ended December 27th 1890.
Houses invaded after removal to them of persons from Tees districts

References.

- I Teesdale rural Sanitary district
II Auckland
III Sedgfield
IV Hartlepool
V Darlington
VI Stockton
VII Middlesbrough
VIII Guisborough
IX Stokesley
X Northallerton
XI Richmond
1 Spennymoor Urban
2 Bishop Auckland
3 Shildon
4 Barnard Castle
5 Darlington
6 Hartlepool
7 West Hartlepool
8 Stockton on Tees
9 South Stockton
10 Middlesbrough
11 Ormesby
12 Normanby
13 Eton
14 Kirkcubbin
15 Redcar
16 Guisborough
17 Skelton & Brotton
18 Saltburn by the Sea
19 Loftus
20 Northallerton
21 Richmond

- Villages containing under 50 Houses
from 50 to 100 Houses
100 to 250 Houses
250 to 500 Houses
Towns
500 to 1000 Houses
1000 to 2500 Houses
2500 to 5000 Houses
5000 to 10000 Houses
upwards of 10000 Houses

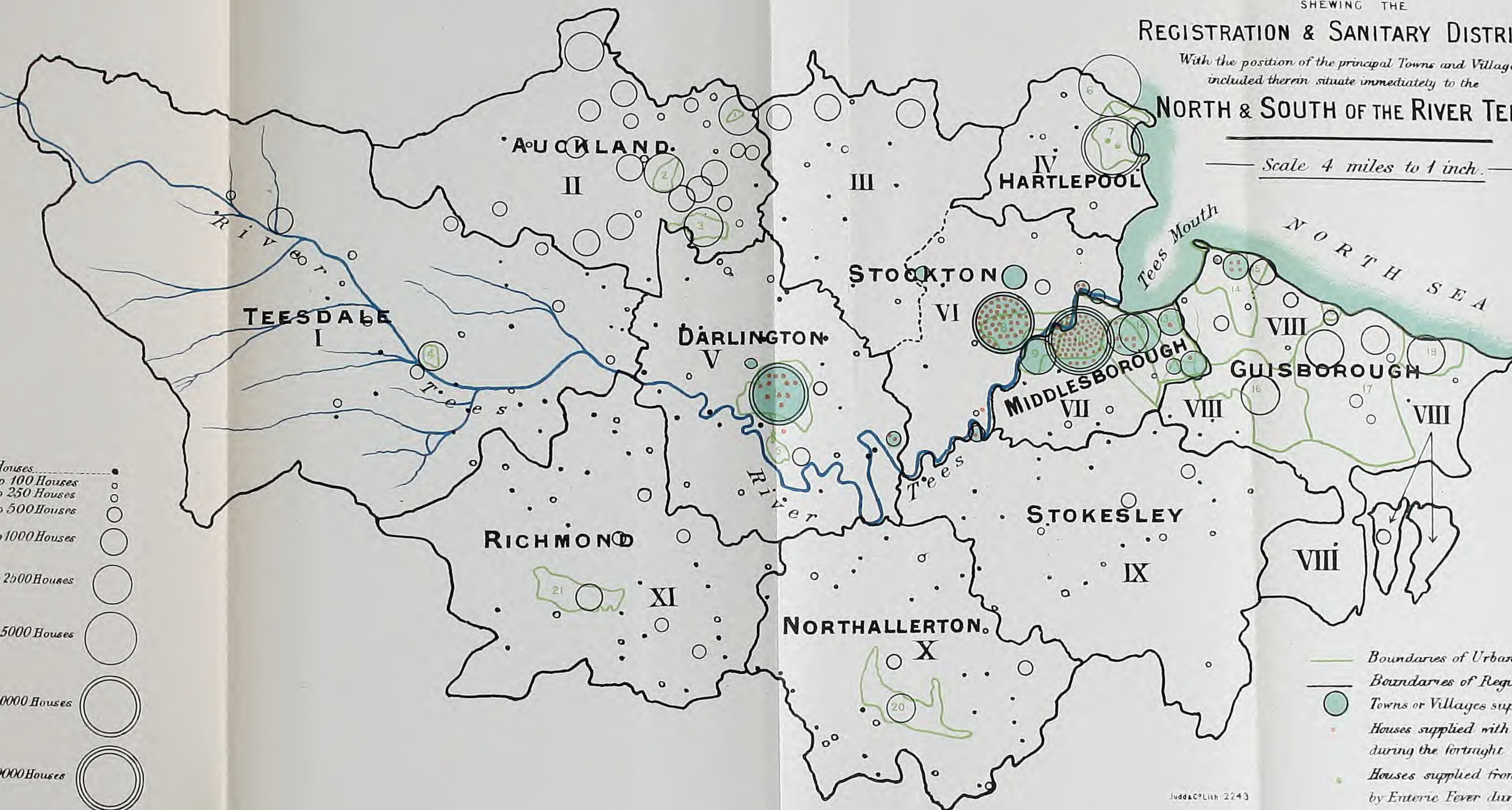
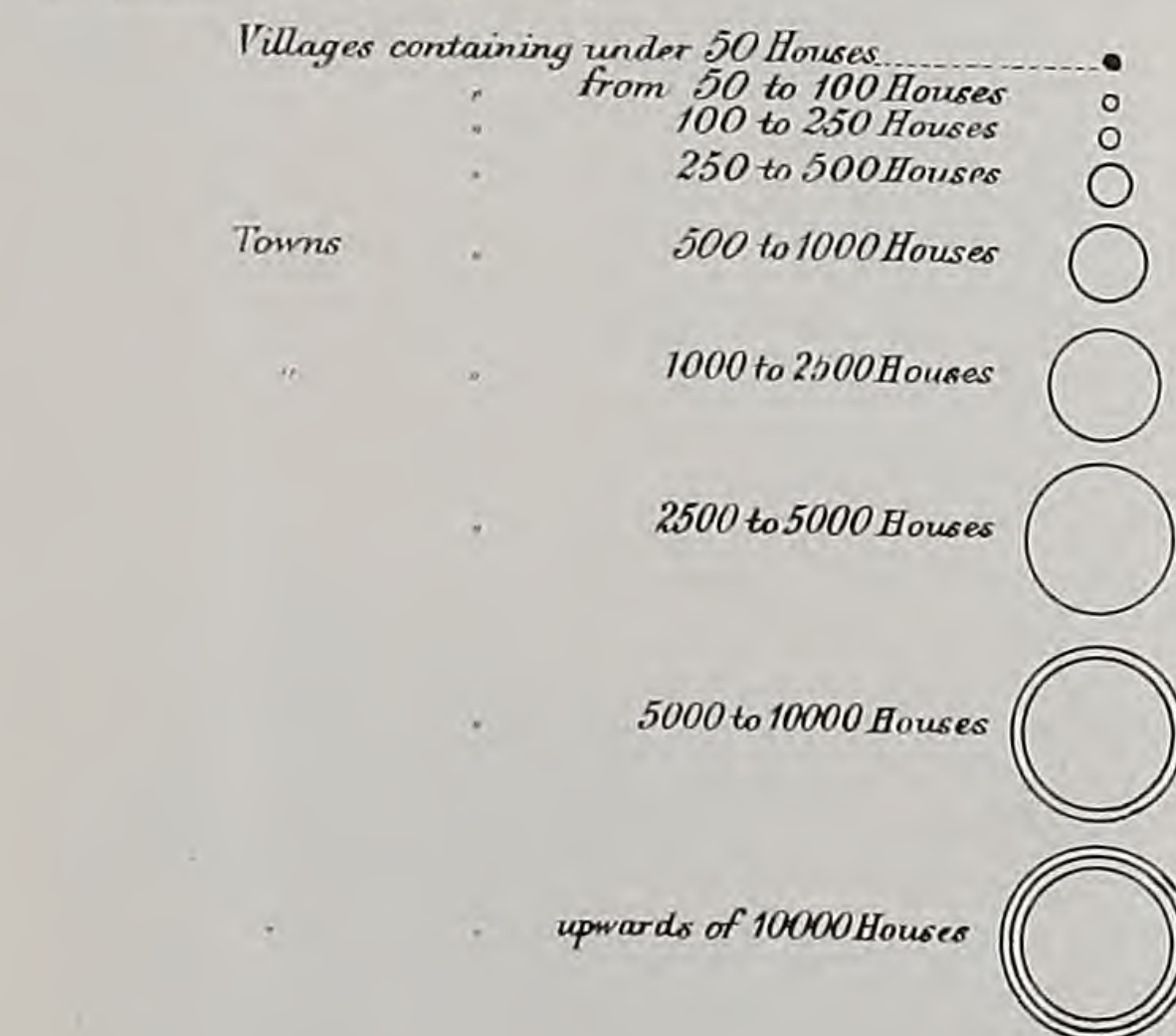


MAP XXV.

REGISTRATION & SANITARY DISTRICTS.

NORTH & SOUTH OF THE RIVER TEES.

— Scale 4 miles to 1 inch. —



Boundaries of Urban Sanitary Districts.

Boundaries of Registration Districts.

Towns or Villages supplied with water from River Tees

Houses supplied with Tees Water invaded by Enteric Fever during the fortnight ended January 24th 1891.

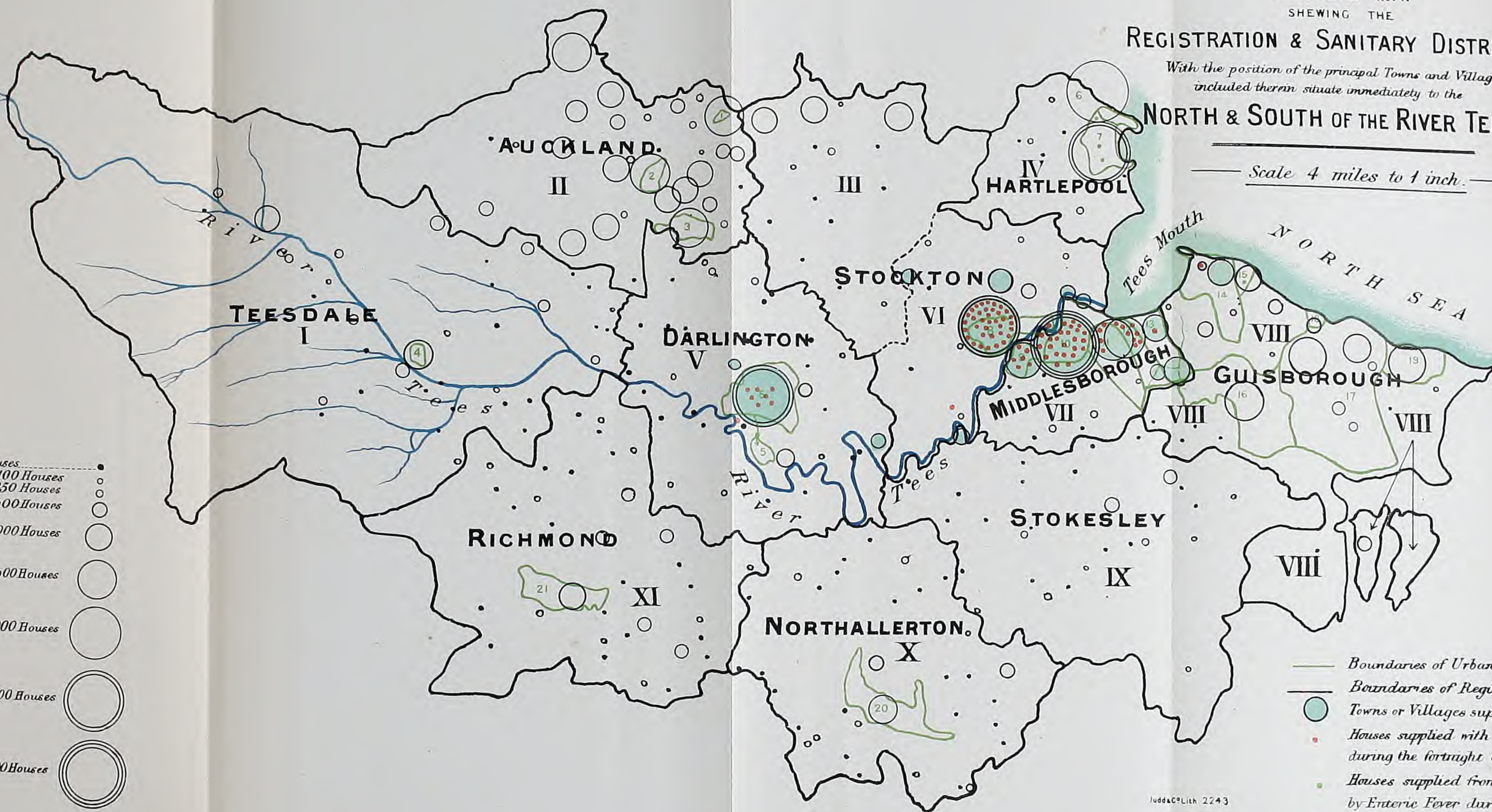
*Houses supplied from other sources than River Tees invaded
by Enteric Fever during the fortnight ended January 24th 1891.*

Houses invaded after removal to them of persons from Tees districts

References.

- I Teesdale rural Sanitary district
II Auckland " "
III Sedgefield " "
IV Hartlepool " "
V Darlington " "
VI Stockton " "
VII Middlesbrough " "
VIII Guisborough " "
IX Stokesley " "
X Northallerton " "
XI Richmond " "
1 Spennymoor Urban " "
2 Bishop Auckland " "
3 Shildon " "
4 Barnard Castle " "
5 Darlington " "
6 Hartlepool " "
7 West Hartlepool " "
8 Stockton on Tees " "
9 South Stockton " "
10 Middlesbrough " "
11 Ormesby " "
12 Normanby " "
13 Eton " "
14 Kirkcubbin " "
15 Redcar " "
16 Guisborough " "
17 Skelton & Brotton " "
18 Saltburn by the Sea " "
19 Loftus " "
20 Northallerton " "
21 Richmond " "

- Villages containing under 50 Houses . . .
from 50 to 100 Houses . . .
100 to 250 Houses . . .
250 to 500 Houses . . .
Towns . . . 500 to 1000 Houses . . .
1000 to 2500 Houses . . .
2500 to 5000 Houses . . .
5000 to 10000 Houses . . .
upwards of 10000 Houses . . .



MAP XXVI
DIAGRAM MAP
SHEWING THE
REGISTRATION & SANITARY DISTRICTS.
With the position of the principal Towns and Villages
included therein situate immediately to the
NORTH & SOUTH OF THE RIVER TEES.

Scale 4 miles to 1 inch.

- Boundaries of Urban Sanitary Districts . . .
Boundaries of Registration Districts . . .
Towns or Villages supplied with water from River Tees . . .
Houses supplied with Tees Water invaded by Enteric Fever during the fortnight ended February 7th, 1891. . .
Houses supplied from other sources than River Tees invaded by Enteric Fever during the fortnight ended February 7th, 1891. . .
Houses invaded after removal to them of persons from Tees districts . . .

References.

- I Teesdale rural Sanitary district.
- II Auckland
- III Sedgfield
- IV Hartlepool
- V Darlington
- VI Stockton
- VII Middlesborough
- VIII Guisborough
- IX Stokesley
- X Northallerton
- XI Richmond
- 1 Spennymoor Urban
- 2 Bishop Auckland
- 3 Shildon
- 4 Barnard Castle
- 5 Darlington
- 6 Hartlepool
- 7 West Hartlepool
- 8 Stockton on Tees
- 9 South Stockton
- 10 Middlesborough
- 11 Ormesby
- 12 Normanby
- 13 Eton
- 14 Kirkcaldham
- 15 Redcar
- 16 Guisborough
- 17 Skelton & Brotton
- 18 Salthurn by the Sea
- 19 Loftus
- 20 Northallerton
- 21 Richmond

Villages containing under 50 Houses
 From 50 to 100 Houses
 100 to 250 Houses
 250 to 500 Houses

Towns 500 to 1000 Houses

1000 to 2500 Houses

2500 to 5000 Houses

5000 to 10000 Houses

upwards of 10000 Houses

MAP XXVII

DIAGRAM MAP

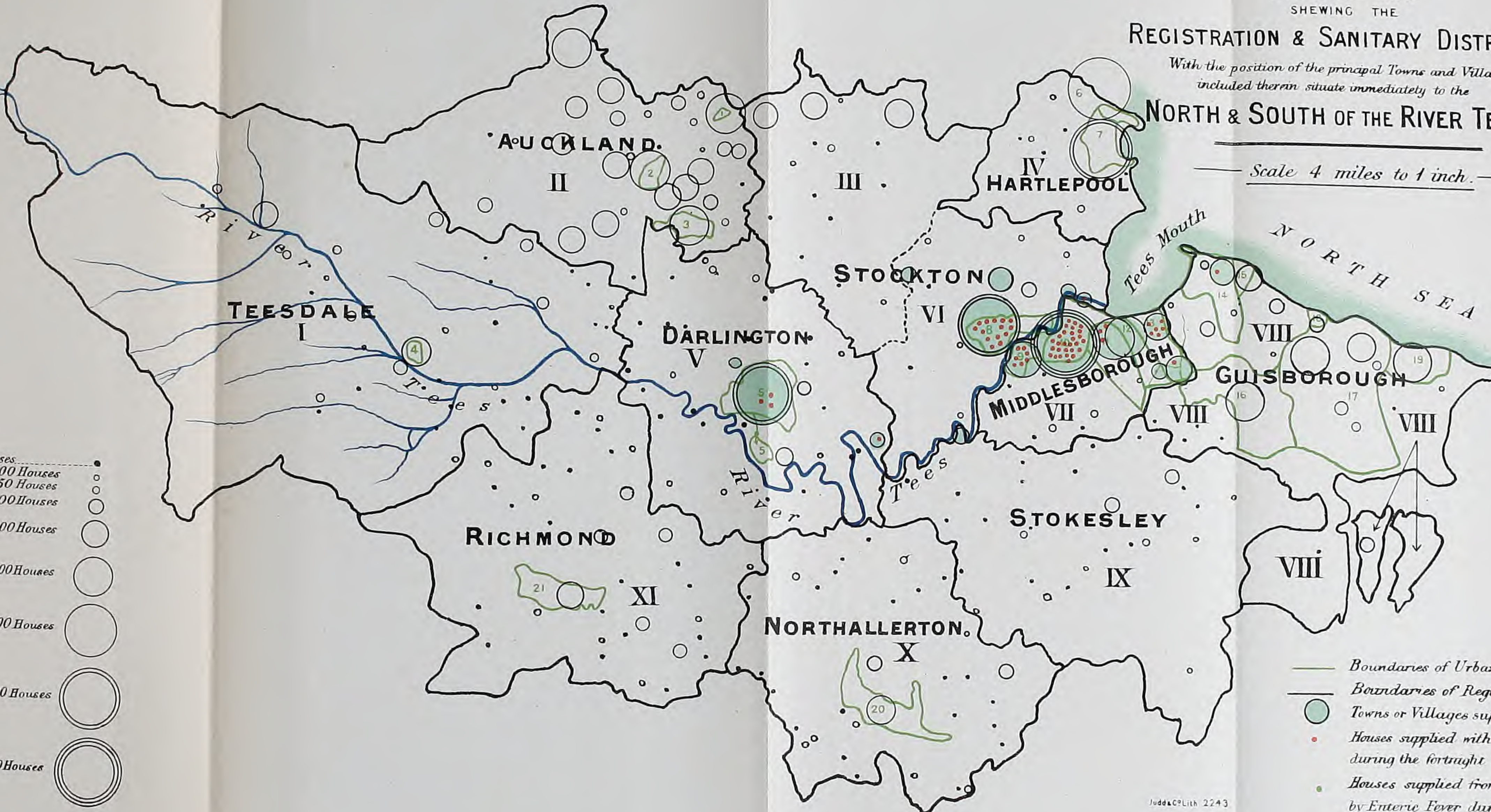
SHOWING THE

REGISTRATION & SANITARY DISTRICTS.

With the position of the principal Towns and Villages included therein situate immediately to the

NORTH & SOUTH OF THE RIVER TEES.

Scale 4 miles to 1 inch.



Boundaries of Urban Sanitary Districts.

Boundaries of Registration Districts.

Towns or Villages supplied with water from River Tees.

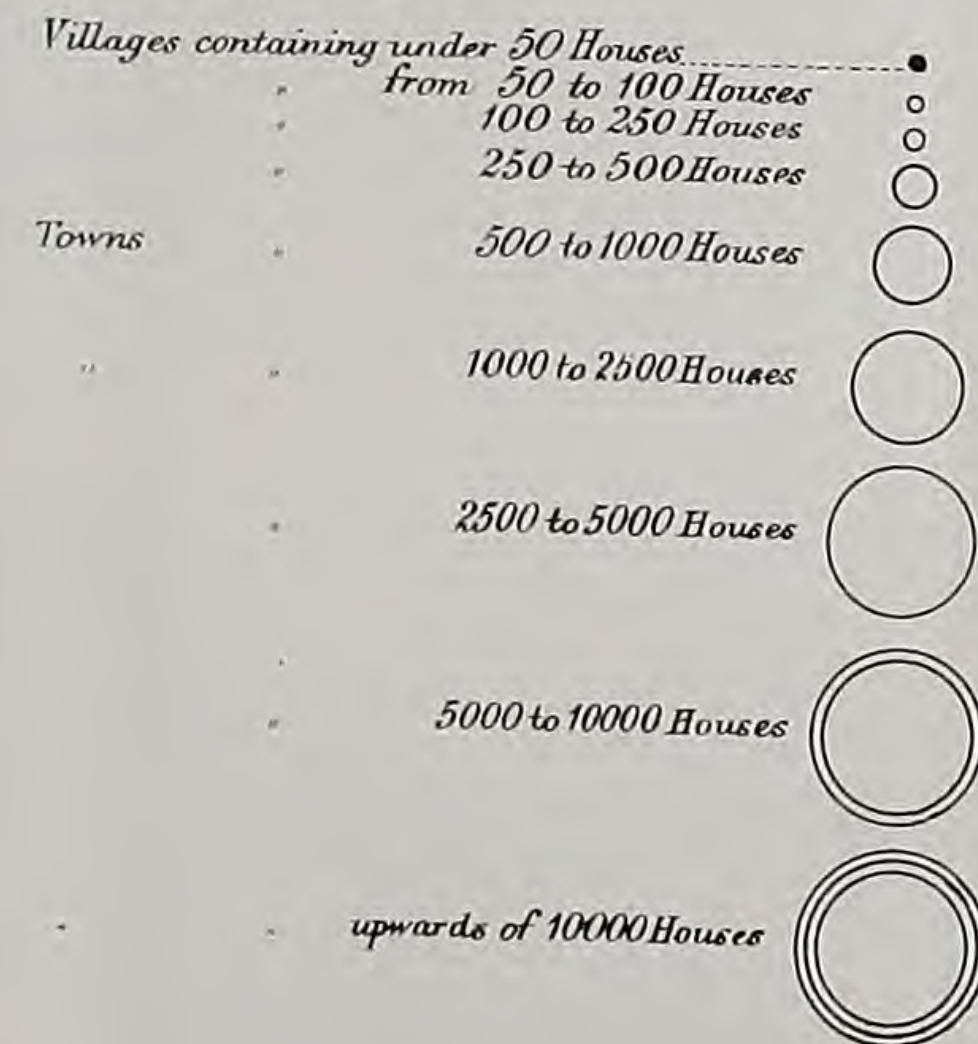
Houses supplied with Tees Water invaded by Enteric Fever during the fortnight ended February 21st 1891.

Houses supplied from other sources than River Tees invaded by Enteric Fever during the fortnight ended February 21st 1891.

Houses invaded after removal to them of persons from Tees districts.

References.

- I Teesdale rural Sanitary district
- II Auckland
- III Sedgfield
- IV Hartlepool
- V Darlington
- VI Stockton
- VII Middlesbrough
- VIII Guisborough
- IX Stokesley
- X Northallerton
- XI Richmond
- 1 Spennymoor Urban
- 2 Bishop Auckland
- 3 Shildon
- 4 Barnard Castle
- 5 Darlington
- 6 Hartlepool
- 7 West Hartlepool
- 8 Stockton on Tees
- 9 South Stockton
- 10 Middlesbrough
- 11 Ormesby
- 12 Normanby
- 13 Eston
- 14 Kirkcubright
- 15 Redcar
- 16 Guisborough
- 17 Skelton & Brotton
- 18 Saltburn by the Sea
- 19 Loftus
- 20 Northallerton
- 21 Richmond



- Boundaries of Urban Sanitary Districts.
- Boundaries of Registration Districts.
- Towns or Villages supplied with water from River Tees.
- Houses supplied with Tees Water invaded by Enteric Fever during the fortnight ended March 7th 1891.
- Houses supplied from other sources than River Tees invaded by Enteric Fever during the fortnight ended March 7th 1891.
- Houses invaded after removal to them of persons from Tees districts

MAP XXIX

DIAGRAM MAP

SHEWING THE

With the position of the principal Towns and Villages included therein situate immediately to the

— Scale 4 miles to 1 inch.





TABLE XXIX. (a).

ENTERIC FEVER DEATHS amongst PERSONS receiving their WATER SUPPLY from the RIVER TEES.

Sanitary District.		Popu- lation.	Number of Deaths from Enteric Fever registered during the Fortnights ended																								Total Deaths from Enteric Fever registered					
			1890.												1891.																	
			12 July.	26 July.	9 August.	23 August.	6 September.	20 September.	4 October.	18 October.	1 November.	15 November.	29 November.	13 December.	27 December.	10 January.	24 January.	7 February.	21 February.	7 March.	21 March.	4 April.	18 April.	2 May.	16 May.	30 May.					13 June.	27 June.
L.		2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.	32.
Darlington, U. (part of)	-	37,458	1	-	-	-	-	1	4	4	2	3	-	3	-	2	1	1	-	1	3	-	-	-	-	-	-	-	27	23	17	6
Darlington, R. (part of)	-	1,903	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	2	-	1	-	-	-	-	-	-	-	-	5	5	2	3
Stockton-on-Tees, U.	-	49,731	1	-	1	2	-	-	4	2	3	7	3	3	1	7	13	7	2	2	4	1	1	3	-	-	-	-	67	58	22	36
Stockton, R. (part of)	-	7,088	-	-	-	-	-	1	3	-	1	1	2	1	-	-	1	2	-	-	2	1	1	-	-	-	-	16	12	9	3	
Sedgefield, R. (part of)	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Stokesley, R. (part of)	-	1,721	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	-
Middlesbrough, U.	-	75,516	5	1	-	1	2	2	3	10	7	4	10	3	2	5	16	9	3	2	2	2	1	1	1	1	2	-	95	78	39	39
South Stockton, U.	-	15,476	-	-	2	2	1	1	1	-	2	3	2	-	-	1	2	4	-	-	1	-	1	-	-	-	1	1	25	17	9	8
Ormesby, U. (part of)	-	8,203	-	-	-	1	-	1	1	1	-	1	1	2	-	1	1	-	-	-	-	-	-	1	-	-	1	-	12	9	7	2
Normanby, U. (part of)	-	8,250	-	1	-	-	-	-	2	1	-	-	1	-	-	-	1	1	1	-	-	-	-	-	-	-	-	7	6	4	2	2
Eston, U. (part of)	-	10,200	-	-	-	-	-	-	-	2	2	1	-	1	-	-	1	3	-	1	1	-	-	-	-	-	-	12	12	6	6	6
Middlesbrough, R. (part of)	-	166	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	1	1	-	1	1
Kirkcubram U. (part of)	-	3,538	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Guisbrough, U. (part of)	-	180	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	1	-	1	1
Totals	-	219,435	7	2	3	6	-	7	19	20	18	20	19	13	3	16	36	30	5	8	9	8	4	6	1	1	4	1	269	223	116	107
Deaths in each fortnight equivalent to an Annual Enteric Fever Death Rate per 10,000 population			8.3	2.4	3.6	7.1	3.6	8.3	22.5	25.7	21.3	23.7	22.5	15.4	5.6	48.9	42.6	55.5	5.9	9.5	10.6	12.2	4.7	7.1	1.2	1.2	4.7	1.2	107	116	107	

ENTERIC
FEVER IN THE
TEES VALLEY,
1890-91; BY
DR. BARRY.

*The Fever
in relation to
Water Supply.*

Mortality.

ENTERIC
FEVER IN THE
TEES VALLEY,
1890-91; BY
DR. BARRY.

*The Fever
in relation to
Water Supply.*

Mortality.

TABLE XXIX. (b).
ENTERIC FEVER DEATHS amongst PERSONS receiving their WATER SUPPLY from SOURCES other than the RIVER TEES.

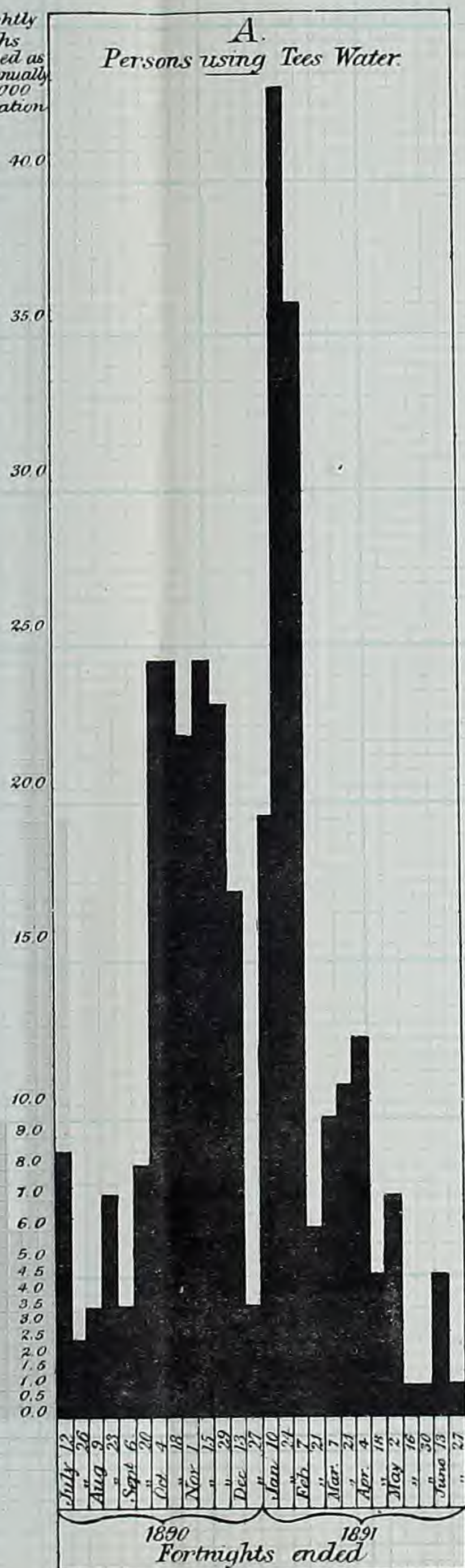
Sanitary District.	Popu- lation.	1890.												1891.												Total Deaths from Enteric Fever during			
		Number of Deaths from Enteric Fever registered during the Fortnights ended																											
		12 July.	26 July.	9 August.	23 August.	6 September.	20 September.	4 October.	18 October.	1 November.	15 November.	29 November.	13 December.	27 December.	10 January.	24 January.	7 February.	21 February.	7 March.	21 March.	4 April.	18 April.	2 May.	16 May.	30 May.	13 June.	27 June.		
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.		
Teesdale, R.	16,622	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Barnard Castle, U.	4,341	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Auckland, R.	62,893	-	-	-	-	-	-	-	8	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Bishop Auckland, U.	10,527	1	1	-	-	-	2	2	2	4	3	2	-	-	2	1	-	3	-	-	-	-	-	-	-	-	-		
Shildon and East Thickley, U.	9,537	-	-	-	-	1	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-		
Spennymoor, U.	6,041	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-		
Darlington, (part of.)	692	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Darlington, R.	9,549	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Darlington, (part of.)	4,873	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Stockton, R. (part of.)	19,554	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Sedgefield, R. (part of.)	21,521	3	-	3	1	1	-	4	1	1	-	-	-	-	-	2	1	-	-	-	-	-	-	-	-	-	-		
Hartlepool, U.	42,492	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
West Hartlepool, U.	2,654	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Hartlepool, R.	3,802	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Northallerton, U.	7,470	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Northallerton, R.	9,398	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Stokesley, R. (part of.)	426	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Ormesby, U. (part of.)	578	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Normanby, U.	495	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Eston, U. (part of.)	1,603	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Middlesbrough, R. (part of.)	671	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Kirkcubbin, U. (part of.)	2,818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Redcar, U.	5,023	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Guisebrough, U.	11,842	-	-	-	1	-	-	1	-	1	-	-	-	2	-	2	-	-	-	-	-	-	-	-	-	-	-		
Skelton and Brotton, U.	2,232	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Saltburn - by the Sea, U.	6,298	-	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Loftus, U.	6,874	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Guisebrough, R. (part of.)	4,216	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Richmond, U.	8,419	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Richmond, R.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Total	284,181	4	1	5	4	4	2	11	10	7	4	2	5	5	3	5	1	3	1	2	2	3	1	1	2	-	1		
Deaths in each fortnight equivalent to an Annual Enteric Fever Death Rate per 10,000 Population of	-	3.7	0.9	4.6	3.7	3.7	1.8	40.1	9.2	6.4	8.7	1.8	4.6	4.6	2.7	4.6	0.9	2.7	0.9	4.8	4.8	2.7	0.9	0.9	4.8	0.0	0.9		



— DIAGRAM VI. —

Showing—A, for Persons using Tees Water and B, for Persons not using Tees Water, within the area of the Tees Inquiry,—the Deaths fortnightly (in rates computed as annual rates), per 10,000 living in each Class, from Enteric Fever during the twelve months July 1890 to June 1891.

Fortnightly deaths expressed as rates annually per 10,000 population



Fortnightly deaths expressed as rates annually per 10,000 population



TABLE XXX.

Sanitary District, or Part of Sanitary District.		Deaths per 10,000 Population in each instance.			
		13 Months to 27th June 1891.	7 Months to 21st March 1891.	3½ Months to 13th Dec. 1890.	3½ Months to 21st March 1891.
PERSONS USING TEES WATER.	DARLINGTON, U. (part of) -	7.2	6.1	4.5	1.6
	DARLINGTON, R. (part of) -	26.3	26.3	10.7	15.8
	STOCKTON-ON-TEES, U. -	13.5	11.7	4.4	7.3
	STOCKTON, R. (part of) -	22.6	16.9	12.7	4.2
	SEDGEFIELD, R. (part of) -	0.0	0.0	0.0	0.0
	STOKESLEY, R. (part of) -	5.8	5.8	5.8	0.0
	MIDDLESBROUGH, U. -	12.6	10.4	5.1	5.2
	SOUTH STOCKTON, U. -	16.2	11.0	5.3	5.2
	ORMESBY, U. (part of) -	14.6	11.0	8.5	2.5
	NORMANBY, U. (part of) -	8.5	7.3	4.8	2.1
	ESTON, U. (part of) -	11.8	11.8	5.9	5.9
	MIDDLESBROUGH, R. (part of) -	*60.2	*60.2	0.0	*60.2
	KIRKLEATHAM, U. (part of) -	0.0	0.0	0.0	0.0
	GUISBROUGH, R. (part of) -	*55.6	*55.6	0.0	*55.6
PERSONS NOT USING TEES WATER.	Teesdale, R. -	0.6	0.6	0.6	0.0
	Barnard Castle, U. -	0.0	0.0	0.0	0.0
	Auckland, R. -	4.9	4.3	3.7	0.6
	Bishop Auckland, U. -	4.8	3.8	1.9	1.9
	Sildon and East Thirkley, U. -	8.4	4.2	4.2	0.0
	Spennymoor, U. -	1.7	1.7	0.0	1.7
	Darlington, U. (part of) -	*16.6	*16.6	*16.6	0.0
	Darlington, R. (part of) -	1.0	1.0	1.0	0.0
	Stockton, R. (part of) -	0.0	0.0	0.0	0.0
	Sedgefield, R. (part of) -	1.0	0.5	0.5	0.0
	Hartlepool, U. -	7.0	2.3	2.3	0.0
	West Hartlepool, U. -	2.1	1.4	0.2	1.2
	Hartlepool, R. -	0.0	0.0	0.0	0.0
	Northallerton, U. -	2.6	0.0	0.0	0.0
	Northallerton, R. -	0.6	0.0	0.0	0.0
	Stokesley, R. (part of) -	0.0	0.0	0.0	0.0
	Ormesby, U. (part of) -	0.0	0.0	0.0	0.0
	Normanby, U. (part of) -	†22.8	†22.8	†22.8	0.0
	ESTON, U. (part of) -	0.0	0.0	0.0	0.0
	Middlesbrough, R. (part of) -	0.0	0.0	0.0	0.0
	Kirkleatham, U. (part of) -	0.0	0.0	0.0	0.0
	Redcar, U. -	0.0	0.0	0.0	0.0
	Guisbrough, U. -	0.0	0.0	0.0	0.0
	Skelton and Brotton, U. -	6.8	5.1	3.4	1.7
	Saltburn-by-the-Sea, U. -	0.0	0.0	0.0	0.0
	Loftus, U. -	3.2	0.0	0.0	0.0
	Guisbrough, R. (part of) -	0.0	0.0	0.0	0.0
	Richmond, U. -	2.4	2.4	2.4	0.0
	Richmond, R. -	1.2	1.2	1.2	0.0

* One death in each instance only.

† Two deaths only.

Figures in *italics* represent deaths of persons who had acquired Enteric Fever outside district.

From this table it will be seen that, as with Enteric Fever attack-rates, so with Enteric Fever death-rates, there was a large excess amongst users of Tees water as compared with non-users of that water. Thus, during the seven months ended 21st March 1891, the Enteric Fever death-rate per 10,000 population in each instance was for users of Tees water, 10.3; for non-users of that water, 2.1. And subdividing these seven months into equal periods of 3½ months, the rates for users and non-users respectively of Tees water were 5.4 and 1.4 in the first period, and 4.9 and 0.7 in the second period; a disproportion (as compared in the case of attack), larger in the early months of 1891 than in the late months of 1890.

This different incidence of Enteric Fever mortality in point of time, fortnight by fortnight, amongst users and non-users of Tees water, during the 9½ months ended 21st March 1891, is illustrated in the annexed Diagram VI.

Comparison then of Diagrams V. and VI. of the facts of Tables XXVIII. and XXX., and the data adduced therefrom, suffice to indicate that among users of Tees water the rate of Enteric Fever *attack* during the two six-week periods ended 18th October 1890, and 7th February 1891, and the rate of Enteric Fever *death* during the two

periods of $3\frac{1}{2}$ months ended 13th December 1890 and 21st March 1891 respectively, were strikingly in excess of those amongst persons not using that water.

This much, then, is certain. Those of the 32 Sanitary Districts suffering exceptionally from Enteric Fever during the two well defined periods just referred to, were in the main districts getting, wholly or in part, water supply from the River Tees. Also, there can be no doubt, that in the districts getting this water there occurred exceptional incidence of Enteric Fever *only on those of their inhabitants who actually consumed it*. And finally it is beyond question that the districts, or parts of districts, thus suffering severely from Enteric Fever, were destitute of community of conditions, such as elsewhere has been found to disseminate that disease, *except in the circumstances of their water supply*.

It will consequently now be necessary to consider with some detail the circumstances of each set of waterworks and the condition of the River Tees, with a view to ascertaining the existence of any possible sources of contamination which might account for the wholesale prevalence of Enteric Fever amongst the consumers of Tees water.

V.—SPECIAL CIRCUMSTANCES OF THE WATER SUPPLY OF THE DISTRICTS INVADDED BY ENTERIC FEVER IN THE TEES VALLEY.

Special cir-
cumstances of
Water Supply.

Darlington
Corporation
Waterworks.

DARLINGTON CORPORATION WATERWORKS.

For the following description of the Darlington Corporation Waterworks, and for the plan given in Map XXX., I am indebted to Mr. Thomas Smith, the borough engineer for Darlington.

The pumping station of the Darlington Waterworks is situate on the Durham side of the River Tees, at Tees Cottage, about two miles west from Darlington, immediately adjoining and to the east of the works of the Stockton and Middlesbrough Water Board. The water is taken from the river by two engines in two separate engine houses. No. 1 engine house (Map XXX., 1) contains a compound condensing beam-engine, erected in 1849, which drives two pumps, one pump drawing water from the river and lifting it to the depositing tank, and the other pumping the water from the filtered water well to the town and to the Bushell Hill service reservoir. Both pumps are estimated to lift 98 gallons per stroke. The suction pipe from the river is 18 inches in diameter.

The engine in No. 2 engine house (Map XXX., 2) was bought, in 1862, from the Stockton and Middlesbrough Water Company. It is a compound condensing beam-engine, exactly similar to that in No. 1 house, and likewise drives two pumps. One pump draws water from the river and lifts it to the depositing tank, and the other pumps the water from the filtered-water well to either the service reservoir at Harrogate Hill, or to that at Bushell Hill. These pumps are each estimated to lift 114 gallons per stroke. The suction pipe from the river is 18 inches in diameter.

Depositing Tanks.—There are three depositing tanks, one of which (Map XXX., 6) receives the water pumped by the engine in No. 1 house, and two (Map XXX., 7 and 7a) receive the water pumped by the engine in No. 2 house. In these tanks the water deposits a considerable quantity of sandy and other matter held in suspension. Between the larger of these tanks (Map XXX., 7a) and the works of the Stockton and Middlesbrough Water Board, communication has been made whereby a supplementary supply from these works may be obtained in case of need.

Filter Beds.—There are seven filter beds, with a total superficial area of 57,950 feet, two of them (Map XXX., 8) are each 82 feet long and 62 feet wide, two more (Map XXX., 9) are each 119 feet long and 45 feet wide, and the remaining three (Map XXX., 10) which are of newer construction than those already referred to, two are each 180 feet long and 72 feet wide, and one 164 feet long and 78 feet wide.

In the case of the older filter beds (Map XXX., 8 and 9) the water passes through 6 feet 6 inches of filtering material, 3 feet 6 inches of which consists of gravel, varying in size from apples at the bottom to shot at the top, and above the gravel 3 feet of sand. In the case of the newer filters (Map XXX., 10) the water passes through 5 feet 6 inches of the filtering material, 3 feet of which is gravel and 2 feet 6 inches of sand.

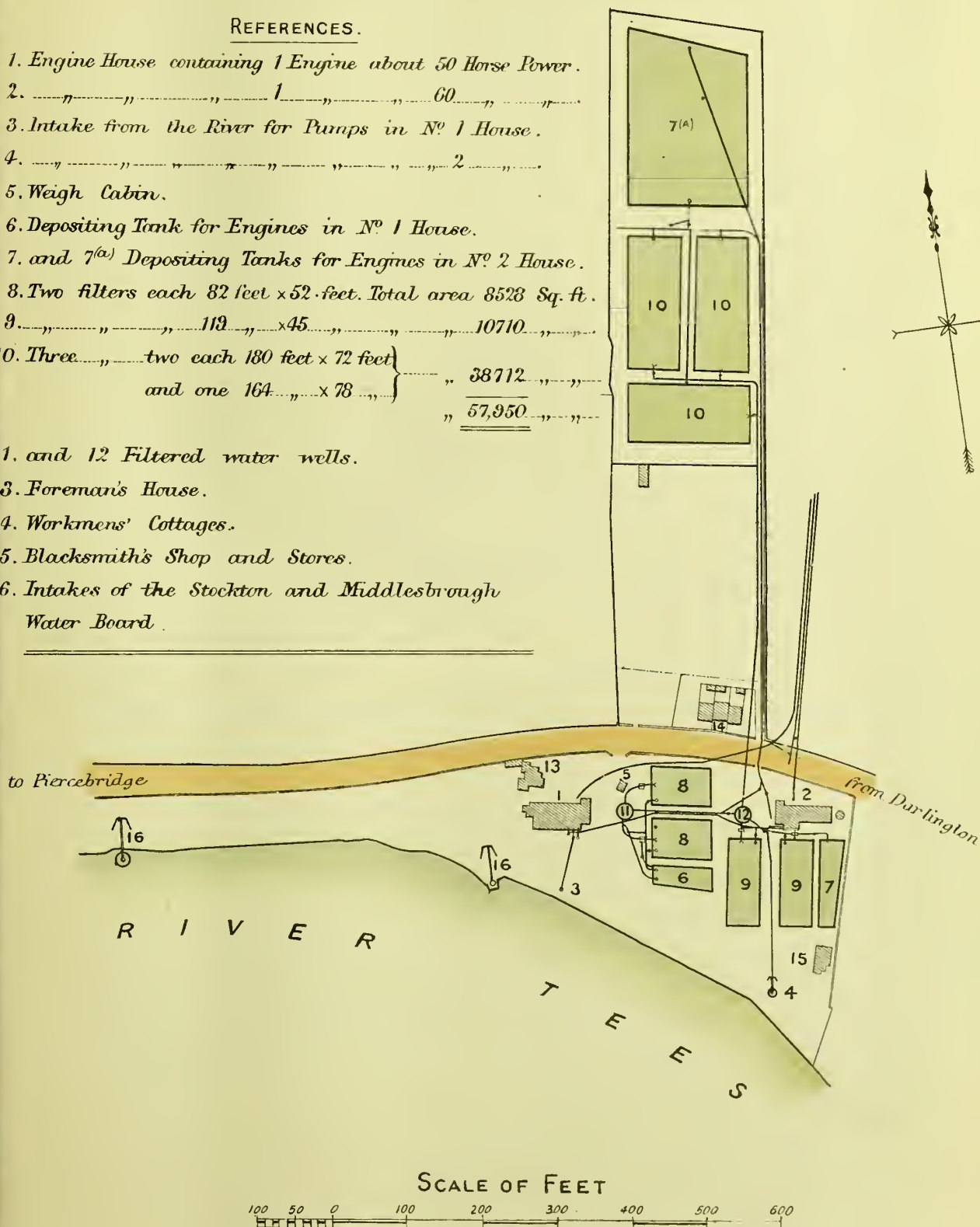
The rate of filtration is from 3 to 4 inches per hour, or about 45 gallons per 24 hours per superficial foot of filter. The surface of each filter is stated to be cleansed upon an average once in six weeks, on each occasion about $1\frac{1}{2}$ inches of the sand being scraped off from the top and washed with water in a tub by agitation

MAP XXX.

DARLINGTON WATER WORKS.
PLAN OF PUMPING STATION, TEES COTTAGE.

REFERENCES.

1. Engine House containing 1 Engine about 50 Horse Power.
2. " " " " " 1 " " " " 60 " " " "
3. Intake from the River for Pumps in N° 1 House.
4. " " " " " " " " 2 " " " "
5. Weigh Cabin.
6. Depositing Tank for Engines in N° 1 House.
7. and 7^(a) Depositing Tanks for Engines in N° 2 House.
8. Two filters each 82 feet x 52 feet. Total area 8528 Sq. ft.
9. " " " " " 112 " x 45 " " " 10710 " " " "
10. Three " two each 180 feet x 72 feet } " 38712 " " " "
and one 164 " x 78 " } " 57,950 " " " "
11. and 12 Filtered water wells.
13. Foreman's House.
14. Workmens' Cottages.
15. Blacksmith's Shop and Stores.
16. Intakes of the Stockton and Middlesbrough Water Board.



15 JUN. 1929



MAP XXXI.

STOCKTON & MIDDLESBROUGH WATER BOARD.
PLAN OF PUMPING STATION, BROKEN SCAR.

REFERENCES.

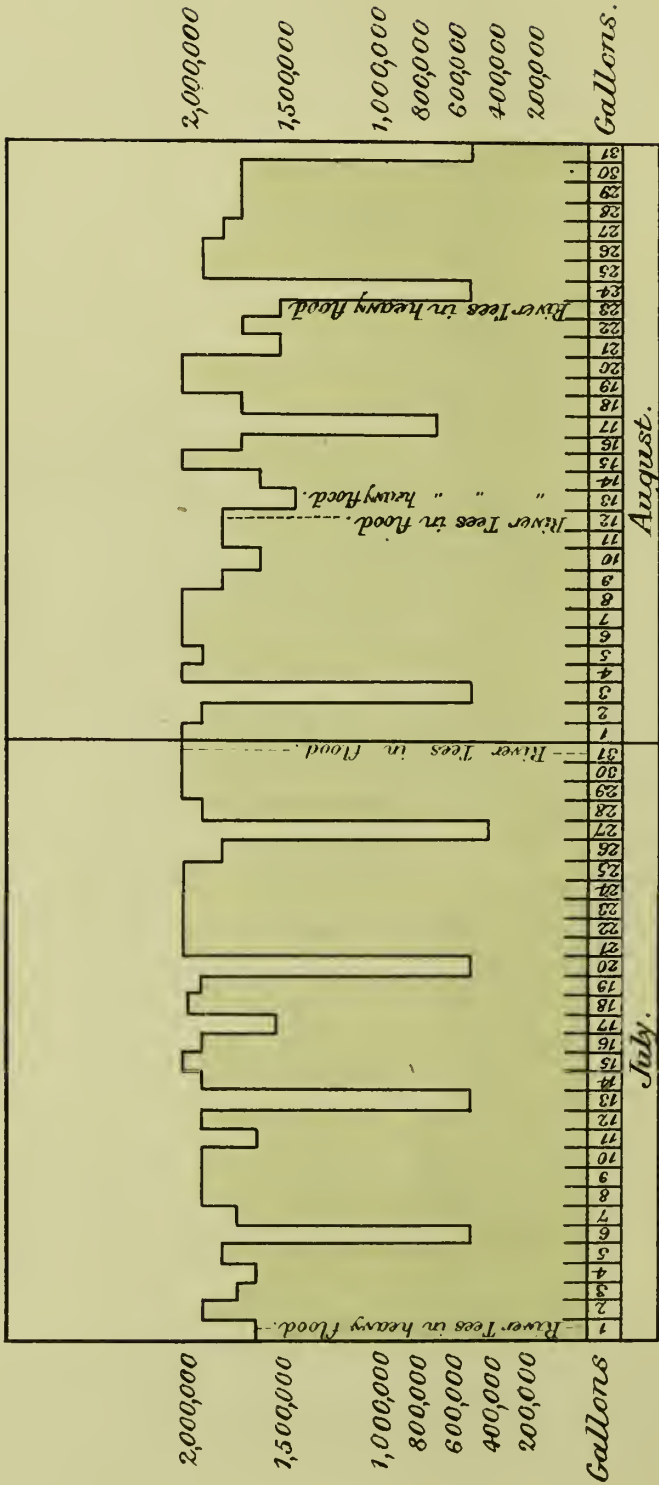
1. Engine House, containing 2 High Pressure Beam Engines each about 75 Horse Power.
2. " " " " 2 Compound Beam Engines each about 100 " " "
3. " " " " 2 " " " " 150 " " "
4. " " " " 1 Horizontal Engine about 50 Horse Power.
- 5, 6, 7, 8. Intakes from the River for Pumps in Nos 1, 2, 3 and 4 Houses respectively.
- 9, 10. Cooling Ponds for Engines in Nos 1 and 2 Houses.
11. Weigh Cabin. 12. Depositing Tanks.
- 13, 14. Storage Tanks, containing 6,395,940 and 6,460,900 gallons respectively.
15. 4 Filters 100 ft. 0 in x 65 ft. 0 in. total area 26,000 Sq. ft.
16. 4 " " 120 ft. 0 in x 120 ft. 0 in " " " 57,600 " " " }
17. 3 " " 150 ft. 0 in x 130 ft. 0 in " " " 58,500 " " " } Total 142,100 Sq. ft.
18. Foreman's House. 19. Workmen's Cottages.



DIAGRAM VII.

DIAGRAM shewing daily amount of water pumped from the River
Tees at the Darlington Water Works during July and August
1890.

(10% to be deducted for slip of pump, &c.)



with rakes. The whole of the sand in each filter is washed on an average once in three years.

Reports by Mr. W. F. K. Stock in 1890 and 1891 on chemical analyses of the water supply of the Darlington Corporation, both before and after filtration, will be found in Appendix G. (1) (2).

Service Reservoirs.—There are two service reservoirs, one at Bushell Hill, about three-quarters of a mile eastward of the pumping station, and the other at Harrogate Hill, situate on the northern boundary of the borough about two miles from the Market Place. The Bushell Hill reservoir has a capacity of 1,000,000 gallons, and that at Harrogate Hill a capacity of 5,500,000 gallons. These reservoirs receive the surplus water which is pumped from the works, and are only used when the pressure is insufficient to carry the water through the pumping mains direct to the town, or at times when the pumps are not working.

Pumping and Service Mains.—There are three mains from the pumping station, which are 10 inches, 14 inches, and 16 inches in diameter respectively. These convey the water from the pumping station through Bushell Hill and Cockerton, and thence through the town to the service reservoir at Harrogate Hill. The branches for the supply of villages and the various parts of the town are taken off directly from these mains.

Amount of Supply.—The average weekly supply of water by the Darlington Corporation Water Works during 1890 was 11,500,000 gallons. The daily pumpings from July 1st to December 31st, 1890, are given in Appendix C. The daily pumpings from July 1st to August 31st, 1890, are shown graphically in Diagram VII.

STOCKTON AND MIDDLESBROUGH WATER BOARD WORKS.

For the following description of the works of the Stockton and Middlesbrough Water Board, I am indebted to Mr. D. D. Wilson, the general manager, as also for the plan given in Map XXXI.

Stockton and
Middlesbrough
Water Board
Works.

The pumping station of the Stockton and Middlesbrough Waterworks is situate on the Durham side of the River Tees at Broken Scar, about two miles west from Darlington. The water is taken from the river by three sets of engines in three separate engine-houses. No. 1 engine-house (Map XXXI, 1) contains a pair of condensing beam engines with single cylinders. Each engine pumps the water from the river to the storage tanks, and also from the filtered water well to the service reservoirs at Fighting Cocks and Sadberge. The cylinders are 30 inches in diameter with a 6-foot stroke, usually making from 12 to 14 revolutions per minute. The pumps which deliver the water to Fighting Cocks are double-acting, and each discharge 63 gallons per stroke. The suction-pipe from the river is 24 inches in diameter. These engines were constructed in 1857.

The engines in No. 2 engine-house (Map XXXI, 2) were constructed in 1868. They are a pair of compound beam-engines, and, as in the other house, each engine pumps water from the river to the storage tanks, and also forces water from the filtered water well to the Fighting Cocks reservoirs. These engines are generally run a little quicker than those in No. 1 engine house. The delivery per stroke of each of these pumps is 119 gallons. The suction-pipe from the river is 30 inches in diameter.

The engines in No. 3 engine-house (Map XXXI, 3) differ from the others in this respect, that one pumps from the river to the storage tanks, and the other pumps from the filtered water well to the Fighting Cocks reservoirs. With this exception the engines are duplicates, and were constructed in 1887. The high pressure cylinder is $22\frac{1}{2}$ inches in diameter with a 5 feet 1 inch stroke; the low pressure, 35 inches diameter, and 7 feet stroke. The pumps are double-acting, 28 inches diameter and 7 feet stroke. The river pump is found to deliver 315 gallons per stroke, and the town pump 331 gallons, so that it is necessary to drive the river pump at least one revolution per minute faster than the town pump. The suction-pipe connected with the river is 28 inches in diameter.

There is, in addition to the above, a pair of small horizontal engines at the river side (Map XXXI, 4), which have been in disuse now for several years.

Subsiding and Storage Tanks.—There are three subsiding tanks (Map XXXI, 12) and two storage tanks (Map XXXI, 13 and 14). In the subsiding tank the water is delivered at one end where it passes through a rough filter which extracts leaves and other such matter before passing it into the body of the tank; the top water

is drawn off by means of a stand-pipe apparatus at the other end of the tank, and so discharged on the filter beds. The water in its progress from one end of the tank to the other, deposits a considerable quantity of sandy and other matter held in suspension. The two "storage tanks," which will hold 13,000,000 gallons, were originally constructed to hold a reserve of water to be used in times of flood in lieu of pumping, but are now used in common with the depositing tanks already referred to, for depositing purposes only. Syphons, which rise and fall with the water in these tanks are constructed so as to draw off the surface water to be discharged on the filter beds.

Under an agreement with the Darlington Corporation, a pipe has been laid from the "storage tanks" to the Darlington Water Works, by means of which, in case of need, a supplementary supply can be furnished for Darlington.

Filter Beds.—There are 11 filter beds with a total superficial area of 142,000 feet; four of them (Map XXXI. 15) are each 100 feet long and 65 feet wide; four of them (Map XXXI. 16) are 120 feet square; and three of them (Map XXXI. 17) are 150 feet long by 130 feet wide.

The water passes through 5 feet 6 inches of filtering material, 3 feet of which is gravel coarser at the bottom and smaller at the top, and above the gravel 2 feet 6 inches of sand.

The rate of filtration is about 6 inches per hour, or about 63 gallons per 24 hours per superficial foot of filter.

The filters are cleansed from time to time according to their condition. The usual method followed is to scrape off about three quarters of an inch of sand, which is then placed in a tub and cleansed by agitation with rakes, clear water flowing in at one end of the tub and running out turbid at the other, and carrying the impurities with it. This operation is continued until the effluent water passes off clear. At longer intervals the whole of the sand is removed, and undergoes this washing process.

Reports on chemical analyses of the water as supplied to consumers by the Stockton and Middlesbrough Water Board, will be found in Appendix G. (3), (4), (5), (6), (7), and (8). The analyses are by Dr. Frankland, by Mr. Allen, and by Messrs. Pattinson and Stead in 1890, and by Mr. A. C. Wilson in 1891.

Pumping Mains.—The mains between the pumping station and the service reservoirs at Fighting Cocks are 15, 24, and 30 inches in diameter respectively. The 24-inch main is continued from Fighting Cocks to the high level service reservoir at Sadberge.

Service Reservoirs.—There are four service reservoirs at Fighting Cocks:—No. 1, 162 feet long by 142 feet wide, containing 1,244,000 gallons; No. 2, 284 feet long and 221 feet wide, containing 5,697,000 gallons; No. 3, 310 feet long by 302 feet wide, containing 6,651,000 gallons, and No. 4, 500 feet long by 310 feet wide, containing 11,032,000 gallons. The total capacity of the four reservoirs is 24,624,000 gallons, and they are all constructed with sloping banks covered with shingle.

The high level service reservoir at Sadberge, which is situate at a height of 80 feet above the reservoirs at Fighting Cocks, is of irregular shape, and has a capacity of 12,000,000 gallons of water.

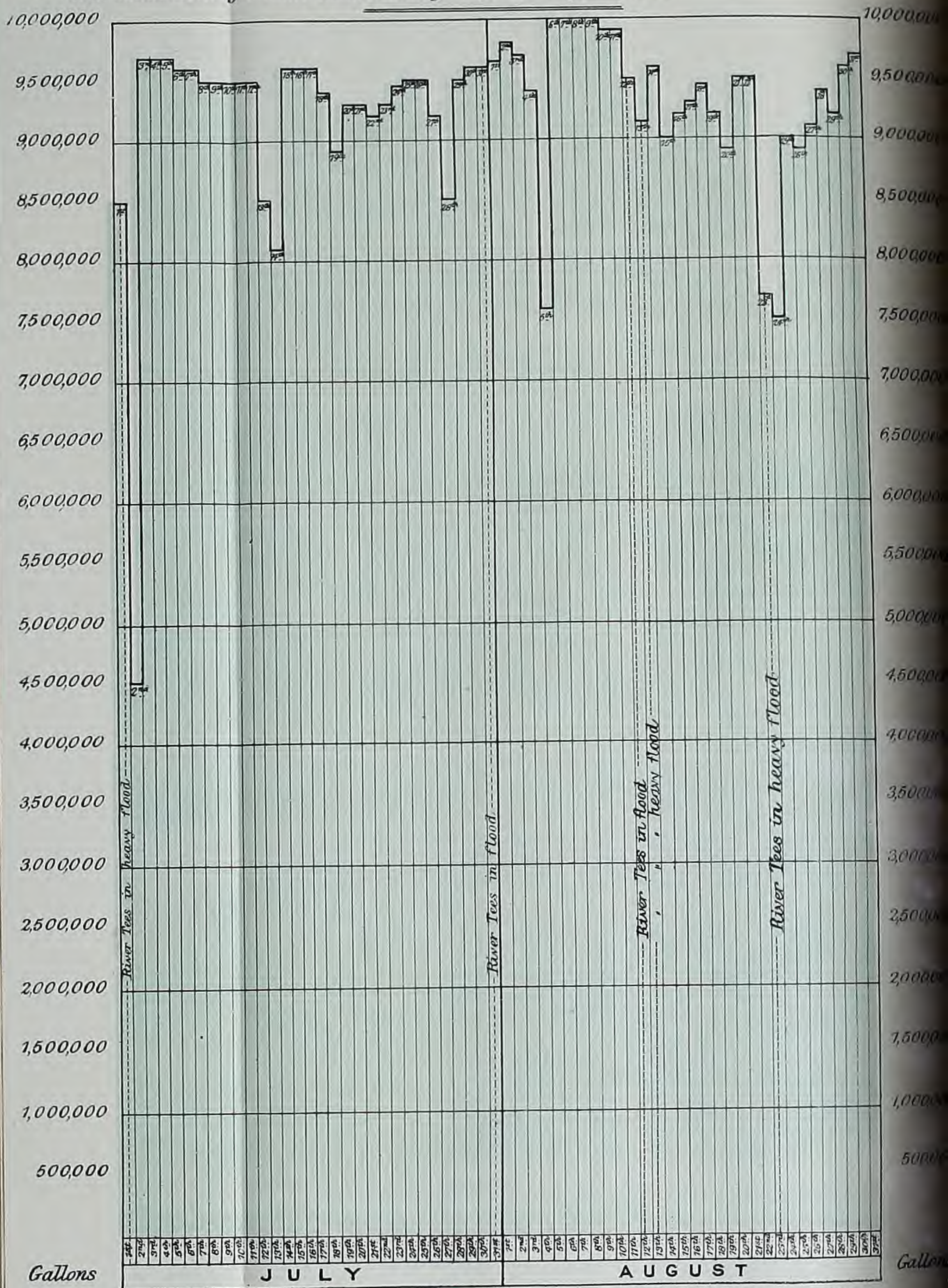
Mains from the Service Reservoirs to the Towns.—From the Sadberge service reservoir there are two mains, one which is carried to Stockton, and thence to Middlesbrough and Eston has a diameter of 33 inches between Sadberge and Stockton, of 30 inches between Stockton and Middlesbrough, and diminishes in diameter to 24 and 18 inches in its course eastward to Eston. A few houses situate at Long Newton and Elton are supplied with water from this main before it reaches Stockton. The portion of this main between Middlesbrough and Eston has not yet been brought into similar use. The second main from Sadberge is 8 inches in diameter, and conveys the water direct to Stillington (Carlton Ironworks). The whole of the water which is brought to Middlesbrough by the first Sadberge main is admitted near the municipal buildings into the mains conveying water from the Fighting Cocks service reservoirs, and is used for the purpose of regulating the pressure.

From the Fighting Cocks reservoirs there are three mains, 30, 15, and 15 inches respectively in diameter as far as Stockton; the 30 inch main is continued with a diameter of 27 inches to Middlesbrough and thenceforward to Eston and Coatham, where it finishes with a diameter of 8 inches; one of the 15 inch mains is continued from Stockton, diminishing in size to Norton, where it finishes 7 inches in diameter. From the pipe going to Norton a branch is taken off to supply the village of Billingham. The other 15 inch main is continued to Middlesbrough and finishes at Eston



DIAGRAM VIII.

DIAGRAM Shewing daily amount of water pumped from the River Tees at the Works of the Stockton and Middlesbrough Water Board, during July and August, 1890.





12 inches in diameter. From the foot of Parliament Street at Stockton, where the mains from the service reservoirs all meet, an 18 inch branch is carried along the east side of High Street and thence along Garbutt Street and Portrack Lane to supply Haverton Hill and Port Clarence. From one of the 15 inch mains between Fighting Cocks and Stockton a branch is taken off near Eaglescliffe Railway Station for the supply of Eaglescliffe and Yarm. For the supply of the villages of South Eston, Old Eston, California, and Normanby, a small pumping plant has been constructed near the gasworks on the Normanby Road. The pumping machinery consists of a pair of compound horizontal engines which draw the water from the 12-inch main already referred to as finishing at Eston, and deliver it through an 8-inch rising main into a small reservoir on the hillside at Eston, capable of containing 500,000 gallons, and from this reservoir is delivered by gravitation to different parts of the villages.

Amount of Supply.—The average weekly supply of water by the Stockton and Middlesbrough Water Board during 1890 was 63,620,000 gallons. Of this amount, 49,386,000 gallons was supplied by meter, chiefly for trade purposes, and 14,234,000 gallons for domestic purposes. The largest quantity pumped in one week was 69,993,000 gallons, during the week ended August 9th, whilst the largest quantity pumped in any one week in previous years was 68,075,000 during the week ending July 12th 1884. The daily pumpings from July 1st to December 31st, 1890, are given in Appendix C. The daily pumpings from July 1st to August 31st, 1890, are shown graphically in Diagram VIII.

CONDITION OF THE RIVER TEES ABOVE THE INTAKES OF THE WATERWORKS.

*Condition
of the River
Tees above the
Intakes of the
Waterworks.*

I now propose to describe briefly the circumstances of the River Tees in its course above the intakes of the waterworks. It has already been noted that these intakes are situate close together at a point two miles west of Darlington. Above this point the River Tees has a drainage area of some 200,000 acres, or 312 square miles. The principal tributaries are the Rivers Lune, Balder, and Greta, all of which have their sources on the Yorkshire side of the river. The quantity of water flowing past the intakes of the waterworks has been variously estimated at from 45,000,000 to 27,000,000 gallons per day in times of greatest drought. For a topographical description of the river I must refer the reader to Appendix D, where a complete account taken from Professor Ansted's "Water and Water Supply" will be found. In Map XXXII. annexed, the catchment basin of the Tees is shown, from its source to the intakes of the waterworks, and in this map the several tributaries, and the position of the principal villages are also shown.

Upon the drainage area of the Tees above the intakes, illustrated in the map, it is estimated that there is a scattered population of some 21,000 persons, of whom 12,000 are said to live close to the river. Within this area the River Tees receives either directly or indirectly the drainage of some 20 villages and hamlets, as well as that of the town of Barnard Castle. A considerable proportion of the land in the drainage area is used for grazing purposes, and some of it is at certain periods of the year covered heavily with manure, of which a considerable quantity undoubtedly finds its way into the river. Many graveyards and farmsteads also add their quota of pollution to the stream, but putting these aside, it will be necessary to describe with some little detail certain particular sources of contamination observed during my inspections of the river, made during the winter of 1890-91.

Proceeding up the river from the intake, the village of Low Coniscliffe (about 30 houses), situate on the Durham side, is reached at a distance of half-a-mile. The slop drainage of this village is conveyed by pipes into an open pool or cesspit, situate in an old channel of the River Tees, at a distance of about 50 yards from its present course. This cesspit at the time of my inspection was full to overflowing with liquid sewage, and there can be no question that during periods of heavy rainfall, a certain amount of its contents pass into the river, whilst in very heavy floods the river actually overflows the portion of the field in which the cesspit is situate. It may be noted that two cases of Enteric Fever occurred in this village early in 1890. Two miles further on, on the same side of the river, the Ulnaby Beck passes into it. This beck conveys the slop drainage of High Coniscliffe (about 60 houses). At a distance of a mile and a half from confluence of the Ulnaby Beck with the Tees, the Dyance Beck is reached. This conveys the slop drainage of three or four hamlets to the river. Immediately above the confluence of this beck with the river the village of Pierce Bridge is situate (about 50 houses), but here the slop drainage is apparently absorbed

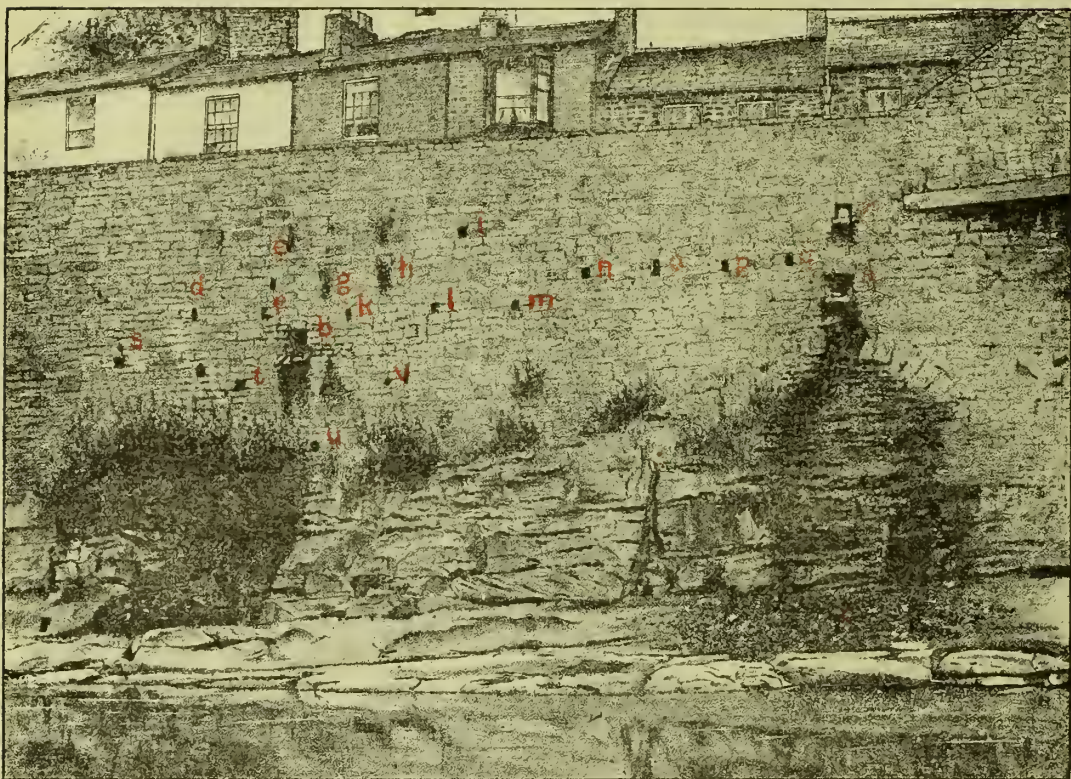
by the soil. A mile and a quarter higher up, and at a distance of six miles from the intake, the village of Gainford (about 180 houses) is reached. In this village many of the houses are of a superior class, and in several of them lodgers are accommodated during the summer months, the village being a favourite place of resort for the inhabitants of the larger towns in the neighbourhood. A small portion of the drainage of the western end of the village is discharged through a rubble drain directly into the Tees at a point near the vicarage, but the principal part of the sewage is conveyed in pipes to an open ditch running down the side of a field situate at the eastern end of the village. This ditch has its outfall into the river. The soil through which the ditch passes is of a porous nature, and during dry weather the liquid portion of the sewage percolates into the land, whilst the solid filth accumulates and forms a black deposit of considerable thickness at the bottom of the ditch. During heavy rain, this black deposit is carried bodily into the Tees, and upon one occasion when I visited the outfall, a black streak could be clearly traced extending from the ditch into the river for a distance of over 100 yards. The dangerous nature of the pollution from this village arises from the fact that several of the houses are provided with water-closets. It may be noted that one case of Enteric Fever (which proved fatal) was imported here in October 1890. About a mile above Gainford the River Tees is joined by the Alwent, or Staindrop Beck. Some three miles above its confluence with the Tees this beck receives the slop drainage of the large village of Staindrop (upwards of 300 houses). The Staindrop drains are so constructed as to allow of considerable deposit which is only washed out when they are either flushed artificially or during periods of heavy rain. At the time of my inspection a considerable amount of solid refuse, consisting of privy contents and the like, had been shot on the margin of the beck in its course through the village. Two miles above the outfall of the Staindrop Beck the village of Winston (about 50 houses) is situate. The slop drainage of this village is conveyed in pipes to a small ravine at its eastern end, whence it is passed directly into the Tees. In its course it receives the overflow from one water-closet cesspool. About half a mile above Winston, on the Yorkshire bank of the river, is situate the village of Ovington (about 30 houses), the slop drainage of which is conveyed by means of rubble drains which have their outfall into a small stream about 500 yards from its confluence with the Tees. Two miles above Ovington Wycliffe, consisting of two or three clusters of houses, is situate. The slop drainage from these houses passes directly into the river, as likewise do the contents of one or two privies, which are furnished with shoots for the purpose of discharging the excrement directly into it. A few hundred yards above Wycliffe, on the opposite, or Durham bank of the river, is Whorlton (about 50 houses). This village is drained by pipes into a small beck which runs into the Tees. About two miles above Whorlton, and 14 miles from the intakes of the waterworks, the River Greta flows into the Tees from Yorkshire. This river, beside receiving the drainage of a large number of farm-houses, conveys the slop drainage of the villages of Brignall (about 20 houses), and of Bowes (about 140 houses), situate a mile and a half, and eight miles respectively, from its confluence with the Tees. About two and a half miles above the point where the Greta enters the Tees, and nearly 17 miles from the waterworks, are situate the town of Barnard Castle, and the villages of High and Low Startforth; the former on the Durham and the two last named on the Yorkshire side of the river.

Barnard Castle, which at the census of 1891 had a population of 4,341 persons, living in 840 houses, is a market town, and during the summer months is an inland watering-place much resorted to by the inhabitants of the northern sea coast towns, as well as by those of Darlington, Stockton, and Middlesbrough. During the spring a regiment of militia undergoes its annual training here, the recruits being billeted in lodging-houses chiefly situate in the lower part of the town near the river. A considerable proportion of the houses of Barnard Castle are of a superior class, and a number of persons there gain a livelihood by letting lodgings. Nearly 400 of the houses are provided with waterclosets. The town was sewered throughout in 1852, and the outfall of the main sewer is directly into the Tees at Demaine's Mill, about half a mile below the town. The drainage of a number of new houses, situate at the north-west end of the town, is discharged into the Percy Beck, which forms the western boundary of the district. In addition to these sources of pollution, numerous others exist where the houses of the older parts of the town abut directly upon the river. A short distance below where the Percy Beck enters the river, the gasworks are situate, the slops and yard washings from which, as well as ashes and other refuse, are passed directly into the river. A little below this point the north end of Bridgegate



Plate I.

BARNARD CASTLE URBAN SANITARY DISTRICT.



Judd & Co Ltd, Lith 63, Carter Lane, 1779 1.91

NORTH END OF BRIDGEGATE, BARNARD CASTLE, FACING THE RIVER TEES.

(a) Main Sewer for Bridgegate.

(b) Original outfall of old moat drain.

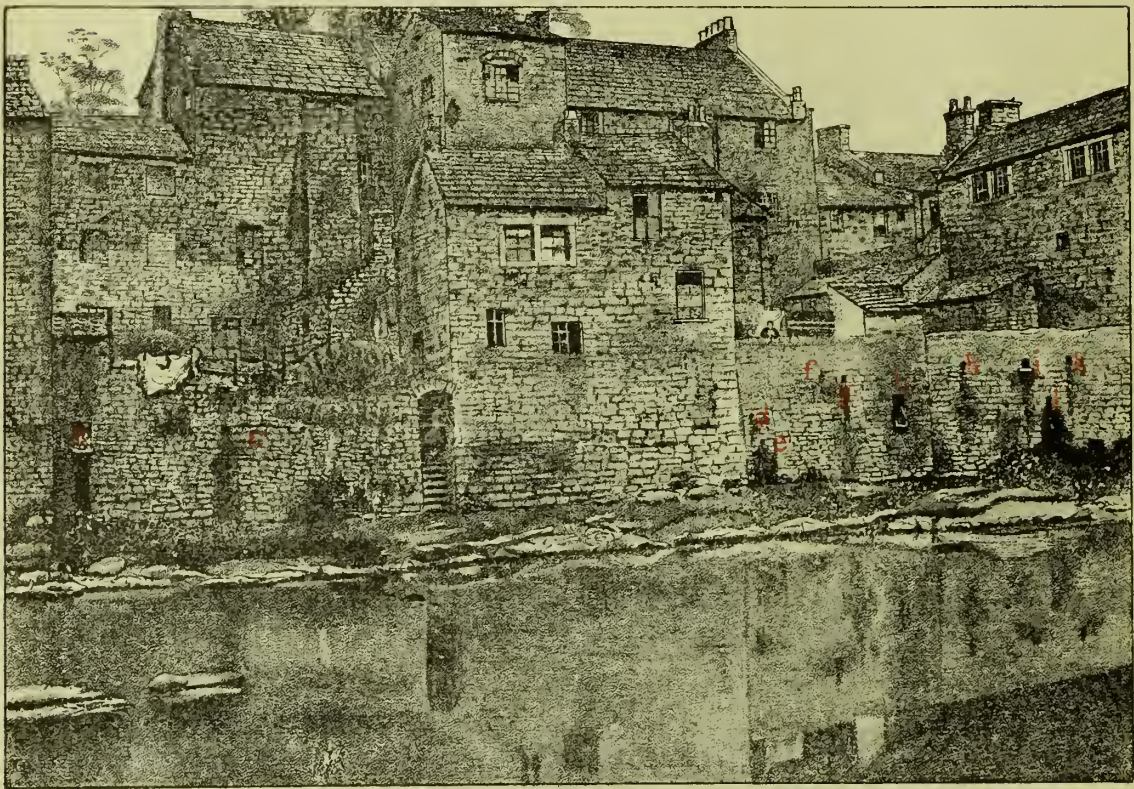
(c) (d) (e) (f) (g) (h) &c. Termination of slop, cellar, foundation and road drains.



To face page 55.

Plate II.

BARNARD CASTLE URBAN SANITARY DISTRICT



Judd & Co. Ltd, Lith. 63, Carter Lane, 1779.191

VIEW SHEWING FORESHORE OF RIVER TEES IN REAR OF HOUSES SITUATE ON WEST SIDE OF
BRIDGEGATE, BARNARD CASTLE.

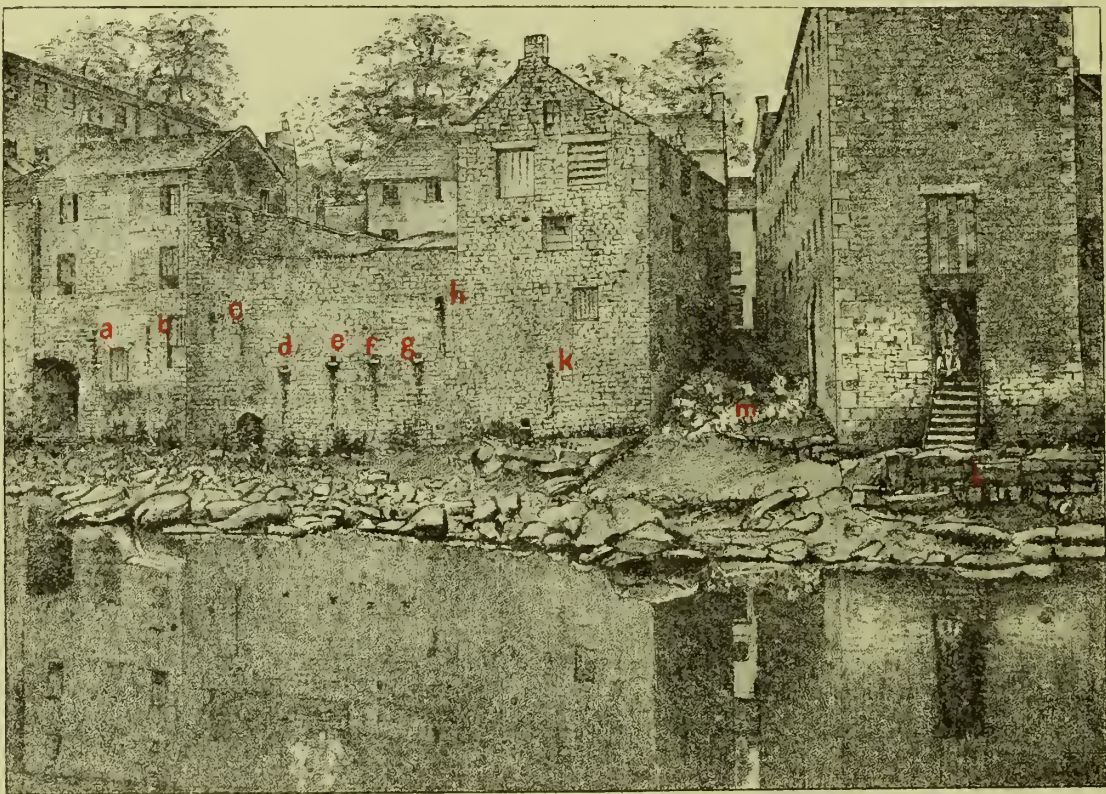
- (a) Privy serving 2 houses one of which is a Common Lodging House.
(b) Privy serving 7 or 8 houses in Beehive Yard.
(c)(d)(e)(f)(g)(h)(i)(k)(l). Slop drains, yard drains, and ash sheets.



To face page 55.

Plate III.

BARNARD CASTLE URBAN SANITARY DISTRICT.



Judd & Co. Ltd. Lith. 63, Carter Lane. 1779. 1. 91.

VIEW OF FORESHORE OF RIVER TEES AT END OF KITCHEN'S LANE, BARNARD CASTLE.

(a) and (b) House drains.

(c) Privy.

(d)(e)(f)(g) Yard drains.

(h) Privy.

(k) Drain from cowhouse.

(l) Slop drain.

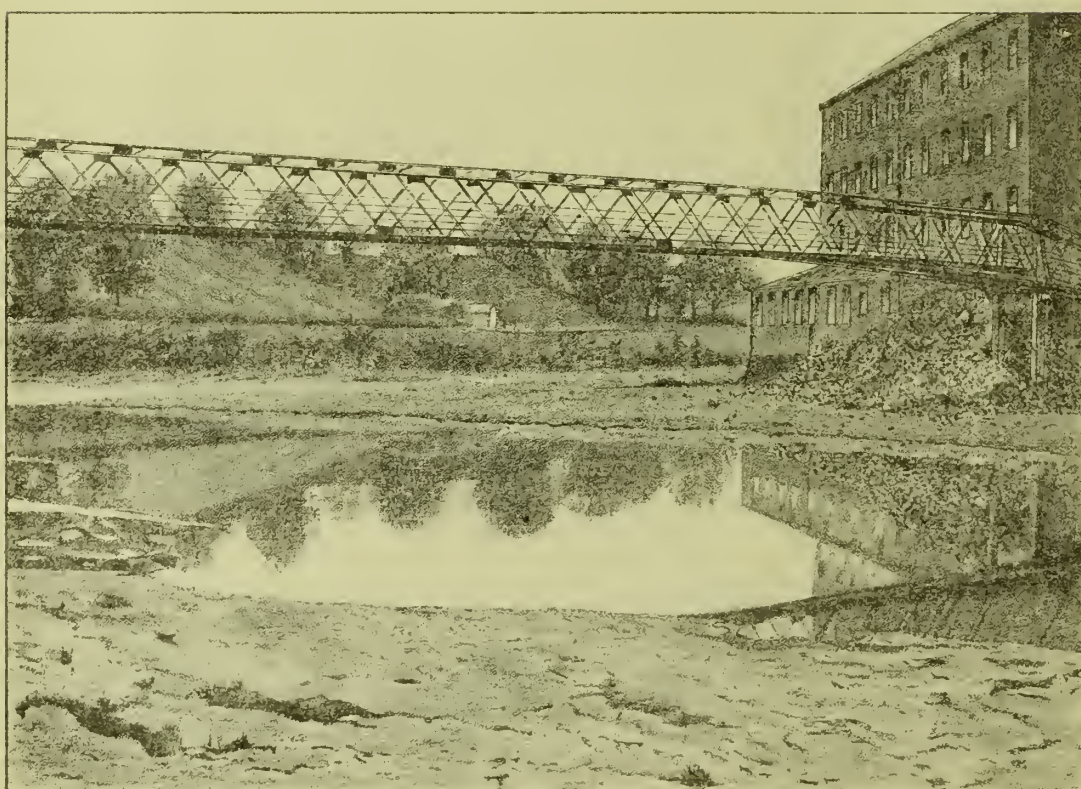
(m) Tip composed of house and midden refuse.



To face page 55.

Plate IV.

BARNARD CASTLE URBAN SANITARY DISTRICT



Judd & Co. Ltd., Lith. 63, Carter Lane, 1779 / 21

VIEW SHEWING RUBBISH TIP ON THE NORTH BANK OF THE RIVER TEES AT THE
THORNGATE FOOTBRIDGE, BARNARD CASTLE.



To face page 55.

Plate V.

TEESDALE RURAL SANITARY DISTRICT.



Judd & Co Lith 73 & 75 Farringdon Rd & Doctors Commons F.R.S. 93

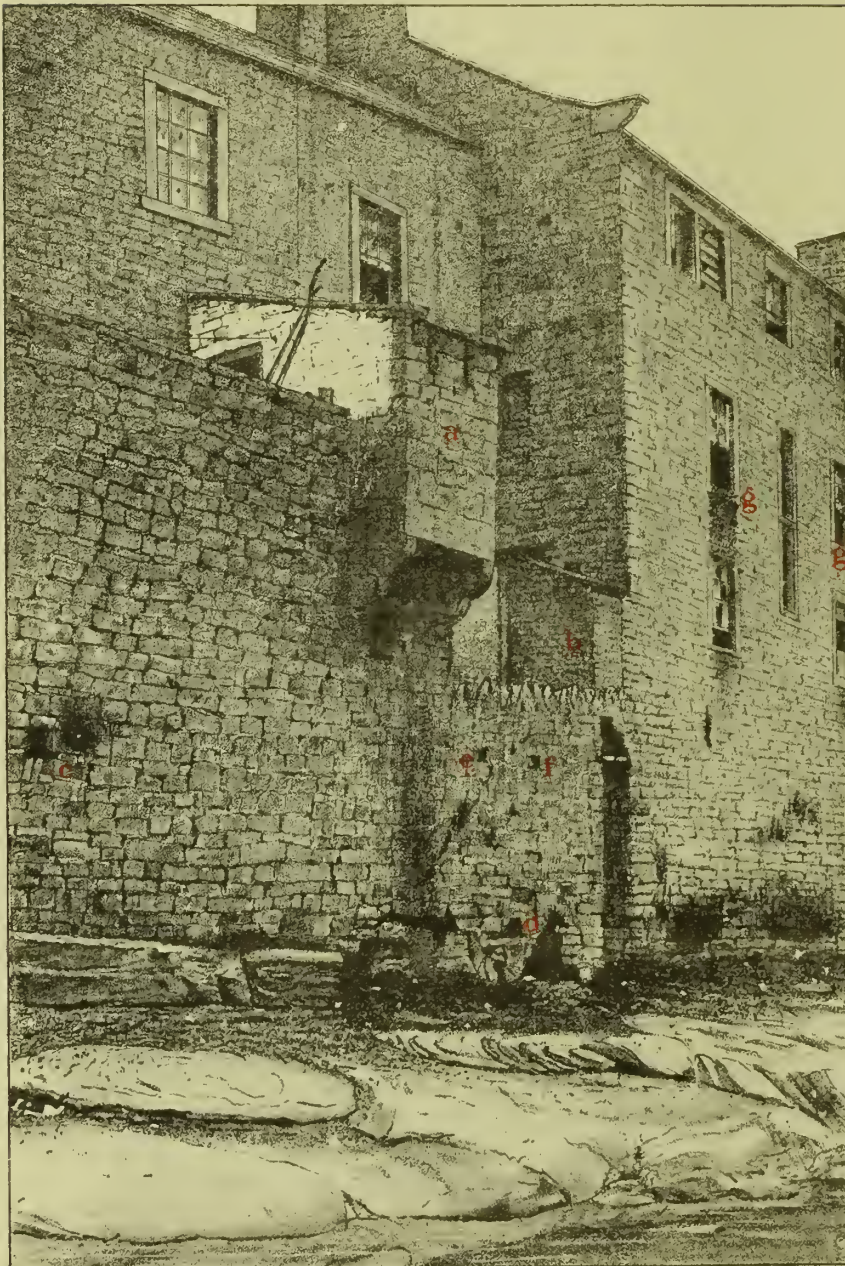
VIEW SHEWING BACK OF SWAN INN, BRIDGE END, STARTFORTH.

- (a)(b)(c)(d)(e)(f) Drains from Water Closets, Urinal, Slopsinks, Stables, &c.
(g) Window from which ashes and dry refuse are thrown on the foreshore.
(h) Yard drains of first house above the bridge.
J. Bry.



Plate VI.

TEESDALE RURAL SANITARY DISTRICT.



Judd & Co. Lith 73 & 75, Farringdon Rd & Doctors' Commons 1873 A 98

VIEW SHEWING BACK OF HOUSES ABUTTING ON FORESHORE OF RIVER TEES
North of Barnard Castle Bridge, Bridge End, Startforth.

- (a) Privy serving 4 houses.
- (b) Privy serving 1 house.
- (c)(d)(e)(f) Yard and foundation drains.
- (g) Windows through which excrement and ashes are discharged from houses unprovided with drains, privies or ashpits.

is reached, and here numerous slop drains discharge at various points through a retaining wall situate on the bank of the river, and here also ashes and house refuse of the dwellings in the neighbourhood are tipped on the foreshore. The main sewer of this portion of Bridgegate has its outfall about halfway down the side of the wall referred to, and the sewage from this, the Bridgegate sewer, collects on the foreshore below, where it forms a black stinking deposit, having fouled the wall with a similar deposit in its course. Below this point the drainage from many houses, and the contents of several privies situate on the bank of the river, are discharged on the foreshore. The privies referred to serve a considerable number of houses, including common lodging-houses, and houses in which militia recruits are billeted, situate in the lowest part of the town. On this foreshore also ashes, house refuse, waste building material, and midden refuse, had, up to the period of my inspection, been deposited in very large quantities. Some idea of the condition of this foreshore, and of the amount of the deposit may be gained from an examination of Plates I., II., III., and IV., which very fairly represent the ordinary state of things existing as lately as the winter of 1890-91. The foreshore during ordinary states of the river varies from 10 to 40 feet in width, and is only covered with water when the river is in flood. In the intervals between floods, the quantity of excrement, ashes, slops, and other filth deposited on this foreshore, has no doubt amounted at times to several scores of tons. In the whole course of my experience as an inspector I had not before encountered, in comparatively small compass, such a mass of stinking abominations as was in existence at the time of my visit on the Barnard Castle foreshore.

Upon the Yorkshire side of the river, immediately opposite Barnard Castle, the villages of *High and Low Startforth* are situate, and on the foreshore on this side pollutions of similar nature, though of less extent than those noted at Barnard Castle, existed at the time of my inspection. The slop-drainage of High Startforth passes into a small stream, which runs into the Tees. At Low Startforth the slop drainage also of the houses is passed into the river. But here, as at Barnard Castle, other sources of pollution exist, as will readily be understood from an examination of Plates V. and VI., which illustrate the condition of the foreshore at Low Startforth immediately below and above the bridge over the Tees respectively. Plate V. shows the back of the "Swan inn," whence a privy shoot, a watercloset, an urinal, the stable drainage, and the slop wastes, all discharge directly on the foreshore. The ashes and house refuse of this inn are thrown on the foreshore through a window. On the upper side of the bridge, and opposite this inn, stands a public urinal, erected by the Barnard Castle "Board of Health" at a time when this district was under their jurisdiction. From this structure the urine trickles down the wall to the foreshore, and thence into the river. Immediately above this are situate the houses illustrated in Plate VI. Attached to one of these will be noticed a projecting privy, supported on corbels of some architectural pretensions, which serves for the use of four houses, the excrement from which is dropped directly on the foreshore. Adjoining this privy is an opening in the wall for the purpose of discharging ashes and other refuse, while just beyond this again is another privy, similar in character to those noted on the Barnard Castle side of the river, from which the excrement passes to the foreshore by means of an inclined flag shoot. Beyond these cottages is a portion of the foreshore (reached by a flight of steps), which at the time of my inspection had been used as a tip for midden refuse, an accumulation of 20 or more loads of stinking refuse having been deposited there. A large flax mill, giving employment to some 200 hands, is situate a little above this point, and here some six or seven closets were provided, all of which discharged their contents directly into the river.

About half a mile above Startforth, on the Yorkshire side, the *Deepdale Beck* joins the river. A little above its confluence with the Tees one or two houses are situate, and here liquid manure from pigsties and stables, in addition to slop drainage, was observed running directly into the beck. The land at the side of the beck was, on the occasion of one of my visits, heavily manured with night-soil as well as stable manure. About half a mile further on the Tees is joined by the *Lartington Beck*. The slop drainage of several houses passes into this beck between the point of its confluence with the Tees and the village of Lartington. The drainage of *Lartington* (about 40 houses) joins this beck at a distance of about a mile and a half from the Tees. Two or three houses in this village, in addition to the Hall, are furnished with waterclosets. About two miles from Lartington is situate the village of *Cotherstone* (about 140 houses), another favourite summer resort of the inhabitants of neighbouring large towns. The drainage of the south end of the village, comprising slop wastes, overflows from

watercloset cesspools and the like, passes into a small stream which runs into the Tees. The drains from the central portion of the village are discharged on land, whilst those from the northern portion pass into a small stream, which discharges into the River Balder, and thence into the Tees. Piggeries and manure heaps furnish their quota of pollution to the little stream referred to.

Immediately above Cotherstone the River Balder joins the Tees. In the Balder Valley an extensive reservoir is in course of construction at Hury, by the Stockton and Middlesbrough Water Board, whence it is proposed to supply moorland water for drinking purposes to the district under their control. About two miles above the entrance of the Balder is the village of Romaldkirk (about 70 houses). In this village, house slops and overflows from cesspools connected with waterclosets are conveyed by means of a rubble drain into an open tank situate in a field, and the overflow from this tank runs into the Beere Beck at a distance of some 700 yards from its junction with the Tees. About a mile above Romaldkirk, on the Durham side of the river, the village of Eccleston (about 140 houses) is situate, the slop drainage from which passes into the river. Two and a half miles above Eccleston, on the Yorkshire side of the Tees, the River Lune runs into it; and a little over a mile above this spot, some 27 miles from the waterworks, is the large village of Middleton-in-Teesdale (about 500 houses), on the Durham side of the river. The main drainage of this village is ostensibly conveyed to land, but, as a matter of fact, the state of affairs here is very similar to that referred to as existing at Gainford. The sewage from a considerable portion of the village is passed into field ditches, whence in dry weather the more liquid portion percolates into the land, and wherein the solid filth is deposited, until in time of heavy rain it is swept in bulk into the river. In this village a number of houses are provided with waterclosets, some of which discharge directly into the river, or into one or other of its tributary streams. Two or three privies, similar to those referred to as existing at Startforth and Barnard Castle, also discharge their contents directly into the stream. At the time of my inspection a considerable quantity of midden refuse had been deposited on the river bed, awaiting a flood which would wash it away. Above Middleton-in-Teesdale, with the exception of the villages of Newbiggin (above 100 houses) and the hamlet of Holwick, situate on the Durham and Yorkshire sides of the Tees respectively, no aggregations of houses exist; but the slop and farmyard drainage of many isolated farm houses is discharged into the river. From Newbiggin much solid refuse, as well as slop drainage, finds its way into the Tees.

There can indeed be no doubt at all that a vast amount of excremental filth and house refuse from one and another source is being continually poured into and conveyed down the River Tees; or that the amount of polluting matter so carried down is enormously increased during periods of heavy rainfall, when the river is in flood. It is to be noted that as regards the filth brought down from Barnard Castle and Startforth there has been, owing to changes in the river conditions during recent years, a notable increase in the bulk of the matter so carried when the river is flooded; for I understand from the Medical Officer of Health for Barnard Castle that prior to the year 1885 a weir known as "The Warrens" existed across the river at the lower end of the town, and that in consequence of this weir the river bed above it was always covered with water; so that at that time there was no foreshore, and the discharges from the privies and drains passed day by day directly into the river, instead of accumulating as at present on the foreshore for considerable periods in the intervals between the floods. A breach is stated to have been made in this weir in the winter of 1885, during a flood, and this breach has grown year after year, until at the present time only a few stones remain.

Having regard to the above conditions of the river, its foreshores, and its tributary streams and ditches, the question arises whether any exceptional circumstances prevailed shortly before the periods when Enteric Fever became suddenly epidemic among the populations supplied with water from the river, of a nature to discharge wholesale into the Tees polluting matter that may have comprised the material of Enteric Fever.

Upon examining the records of rainfall obtained from various observers in the Tees Valley, together with the observations made by the Water Bailiffs of the Tees Salmon Fishery Board as to the state of the river, it was at once seen that this question could be answered in the affirmative as far as the occurrence of floods in the river were concerned. In Appendix E. will be found copies of the daily rainfall registers kept in 1890 at Middleton, Barnard Castle, Whorlton, Staindrop, Darlington, and Middlesbrough, and in Table XXXI. I have given a summary, fortnight by fortnight, of these returns. In Appendix F. is given an abstract of the observations made during

1890 as to the occurrence of floods in the Tees, by the Water Bailiffs of the Tees Salmon Fishery Board, stationed at Blackwell and at Middleton One Row respectively.

TABLE XXXI.

RAINFALL in INCHES observed at certain STATIONS in the TEES VALLEY, FORTNIGHT by FORTNIGHT, January 1st to December 27th 1890.

Rainfall
in Tees Valley
in 1890.

Fortnight ending	Mickleton.	Barnard Castle.	Whorlton.	Raby Castle, Staindrop.	Southend, Darlington.	Albert Park Middles- brough.
January 11th*	1.70*	1.515*	1.20*	0.30*	0.66*	0.39*
" 25th	1.74	1.670	1.30	0.68	1.14	0.79
February 8th	0.75	0.520	0.45	0.26	0.49	0.62
" 22nd	0.62	0.925	1.06	0.05	0.94	0.69
March 8th	0.71	0.520	0.35	0.87	0.20	0.53
" 22nd	1.01	0.470	0.63	0.09	0.75	0.62
April 5th	1.15	1.110	1.13	0.37	0.86	0.51
" 19th	0.28	0.540	0.59	0.34	0.36	0.33
May 3rd	0.94	0.795	0.64	0.70	0.59	0.33
" 17th	1.43	1.645	1.72	1.12	1.67	2.03
" 31st	0.49	0.390	0.32	0.88	0.41	0.71
June 14th	1.21	1.645	1.54	2.11	0.89	0.84
" 28th	0.44	0.535	0.39	1.01	0.59	0.69
July 12th	2.20	1.805	1.80	1.05	1.86	1.41
" 26th	0.67	0.975	1.30	0.81	0.93	0.36
August 9th	0.61	0.660	0.67	2.30	0.40	1.26
" 23rd	4.35	3.660	3.15	2.85	3.21	3.80
September 6th	1.18	1.055	0.99	1.81	1.62	1.91
" 20th	0.46	0.610	0.56	0.51	0.58	0.36
October 4th	1.24	0.465	0.41	0.45	0.81	0.82
" 18th	1.10	0.825	0.76	0.57	0.45	0.56
November 1st	1.06	0.975	0.74	0.80	1.27	1.59
" 15th	1.94	2.050	2.03	2.41	1.31	1.03
" 29th	1.34	2.655	0.89	2.10	1.83	1.81
December 13th	0.68	0.540	1.07	0.58	0.51	0.43
" 27th	0.94	0.710	0.58	0.44	0.94	1.04

* Eleven days only.

Although I have given the records of rainfall in Table XXXI. from a number of stations, I propose to consider the record kept at Barnard Castle only; for, as has been already seen, it is at this place that the greatest amount of pollution of the river water in times of heavy rainfall would be likely to arise. In like manner I propose to consider the observations as to the state of the river at the Blackwell Station only, as this station is situate close to the intake of the waterworks, whereas the observations taken at Middleton One Row are liable to mislead as to the state of the river at the intakes, owing to the fact that the last-named station is situate below the confluence of the River Skerne (a river said to be very liable to floods) with the Tees.

Upon examining the register of rainfall taken at Barnard Castle, it will be observed that the heaviest fortnightly rainfall recorded occurred in the fortnight ending August 23rd, when upwards of 3.6 inches of rain were registered; and that the next heaviest rainfall occurred in the fortnights ended November 15th and November 29th, when 2 inches and 2.6 inches respectively were registered.

From the observations made as to the state of the river at Blackwell, it appears that the river was recorded to have been "much flooded" on the 13th August, and "very much flooded" on the 23rd August; and that the last occasion prior to the 13th August, when an exceptionally heavy flood had been recorded, was on July 1st, some six weeks earlier. From the same record it appears that exceptionally heavy floods occurred on November 9th (10 feet) and December 1st (8 feet) respectively. Upon reference to the daily record of rainfall it will be found that the flood on December 1st was no doubt due to the melting of snow which had fallen continuously from the 24th to the 28th November inclusive.

Here, then, was a heavy flood on 13th August, occurring after an interval of six weeks during which no exceptional flood had been recorded; and on the 1st December occurred another heavy flood, in this case following the last previously recorded heavy flood at an interval of three weeks, but in this case caused by the melting of snow.

Floods in
River Tees
in 1890.

In view of the facts I have recorded as to excremental and other refuse stored on the banks and in the neighbourhood of the Tees at points above the intakes of the waterworks, and ready to be swept into the stream on the occasion of the next ensuing flood, the floods recorded to have occurred on August 13th and on December 1st are noteworthy circumstances that are parallel (making allowance for what is known as to the incubation period of Enteric Fever) to the sudden diffusions of Enteric Fever that were observed in all the districts supplied with Tees water, and which commenced on or about September 7th and December 28th respectively.

The time relations of the outbreaks of Enteric Fever and the rainfall and floods in the Tees are illustrated in Diagram IX. annexed.

So far fouling, in the broadest sense of the word, of the river, has alone been considered. As to opportunities for specific contamination of the river water parallel with the observed epidemic outbursts of Enteric Fever in districts supplied from the Tees, there is not as regards the epidemic outburst of September 1890 direct evidence of antecedent prevalence of any magnitude of Enteric Fever in towns and villages above the intakes. At Barnard Castle only, where two cases of the disease were known to have occurred early in September, was antecedent prevalence of Enteric Fever demonstrable. But, as is well known, slight attacks of Enteric Fever frequently go unrecognised; and when it is borne in mind that in towns and villages above the intakes there were sojourning, temporarily or otherwise, during the summer of 1890, a considerable number of tramps and visitors, many of them from that area of the north of England which the Registrar-General has shown* to have been of late years specially prone to Enteric Fever, a source or sources of infection of the river parallel with the September outbreak may not be far to seek. As regards the second outburst, that of December, the case is altogether different. Antecedently thereto, numerous opportunities had undoubtedly occurred for the introduction of the specific material of Enteric Fever into the river above the intakes. For not only had persons who had acquired the disease in the invaded towns during the first epidemic period gone to villages and towns further up the river in search of health, but persons from the upper reaches of the river had themselves acquired the disease whilst visiting infected places during the first epidemic period, and had returned home whilst their disease was in process of development.

But however this may have been, the liability of the Tees to dangerous fouling has long been admitted, and as regards the works of the Stockton and Middlesbrough Water Board, a few notes as to the history of the undertaking will, in the light of recent events be instructive. Prior to 1876, the waterworks for the supply of Stockton and Middlesbrough were in the hands of a private company, and as far back as 1870 the Corporation of Middlesbrough instructed their Borough Surveyor to inspect the river above the intake, and to report as to the sources of contamination existing at that time. In 1872, the Sanitary Committee of the same Corporation inspected the river from the intake to Middleton in Teesdale, with a similar object in view. Further, in 1875, the Water Company, having promoted a Bill in Parliament, which, amongst other things, was to authorise the Company to erect new engines, to construct new filter-beds, to raise further capital, and to extract an unlimited quantity of water from the Tees, petitions were lodged against the Bill by the Corporations of Middlesbrough and Stockton, the Tees Conservancy Commissioners, the Tees Salmon Fishery Board, and others. The Corporations contended, amongst other demands, that the Water Company should be compelled to take their water from a part of the river where it was free from any sewage contamination; and the consideration of the Bill engaged the attention of a Committee of the House of Commons for 15 days, many witnesses, both scientific and other, being brought forward to prove the contamination of the water supply. The following short extracts from evidence given on behalf of the Corporations by Mr. D. D. Wilson, the present General Manager of the Stockton and Middlesbrough Water Board, who was at that time a member of the Middlesbrough Corporation; by Mr. T. H. Bell, now Chairman of the Water Board, at that time Mayor of Middlesbrough; and by Mr. W. Bulmer, a member of the Water Board, who was at that time, and is now, a member of the Middlesbrough Town Council, is interesting as showing the opinions held then as to the impurity of the Tees water by leading representatives of the largest town in the district.

Mr. DAVID DOULL WILSON, examined May 4th, 1875.

"Q. 5575. You think it [the water supply] is unsatisfactory?

"A. I think it is unsatisfactory.

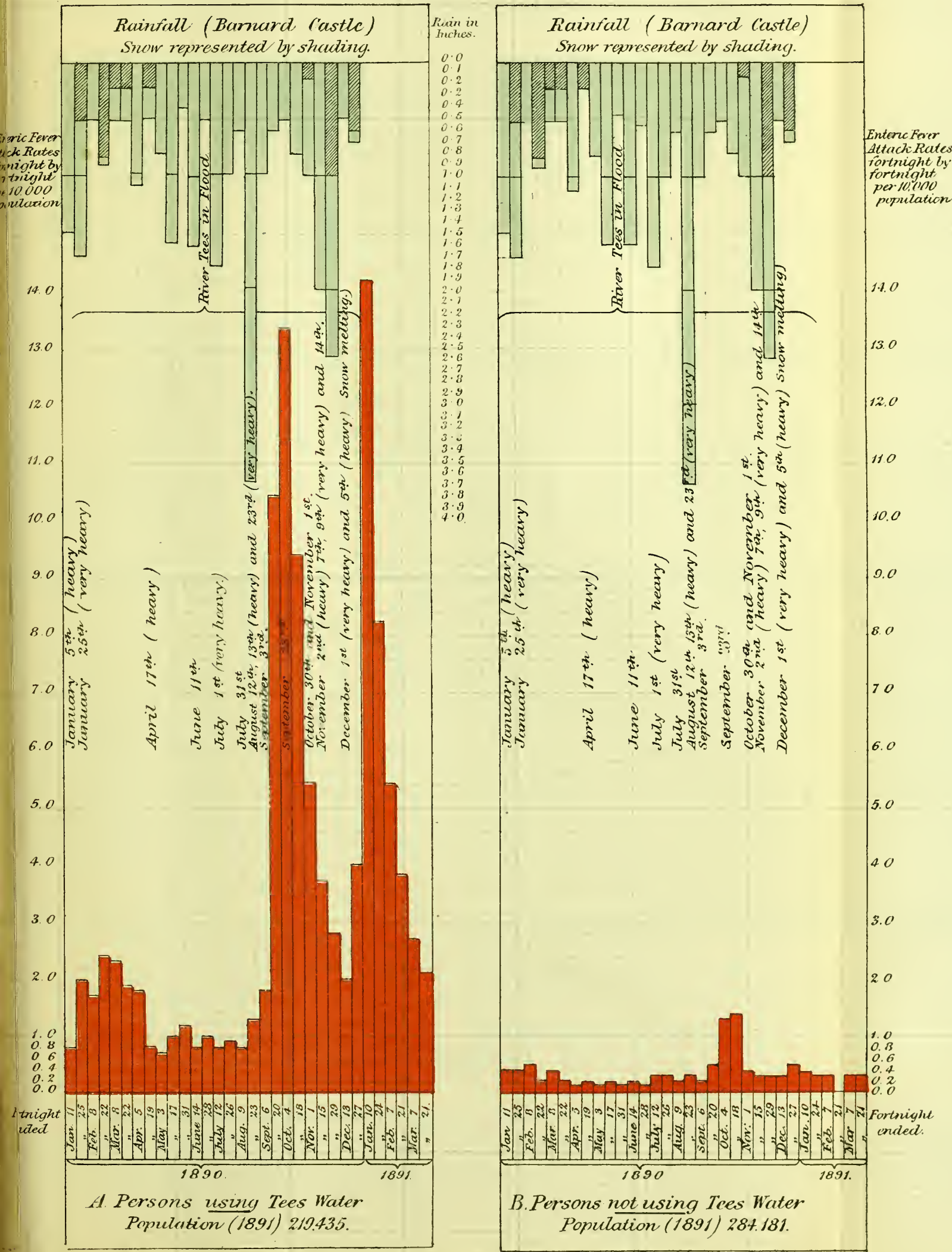
"Q. 5576. Altogether you represent this as an improper source of supply?

"A. Yes, I represent it as an improper source, from the pollutions that go into the river.

* Fifty-third Annual Report of the Registrar-General of Births, Deaths, and Marriages in England (1890). [C.—6178], p. xii.

DIAGRAM IX.

Showing A, for Persons using Tees Water and B for Persons not using Tees Water within area of the Tees Inquiry the Attack Rate, per 10,000 living in each class, from Enteric Fever fortnight by fortnight from January 1890 to March 1891. (at the top of the Diagram to depicted the Rainfall recorded fortnightly in 1890 at Barnard Castle, and elsewhere in the Diagram note is made of Tees conditions as recorded at Blackwell.)



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"Xd. Q. 5577. Are you one of those who are in favour of the water supply being in the hands of Corporations?

"A. I am only in favour of its being in the hands of the Corporation, because it seems to be impossible to get unpolluted water from the present company.*

Mr. THOMAS HUGH BELL, examined May 5th, 1875.

"Q. 5930. Do the Corporation entertain a very strong objection to the continuance and increase of the supply from the existing source for domestic purposes?

"A. There is not only in the Corporation, but in the town itself, the very strongest possible objection to our being supplied with water which is drawn from a district above which there are 10,000 inhabitants whose sewage is flowing into the river.

"Q. 5931. Those 10,000 persons whom you speak of are 10,000 persons living upon the margin of the river, are they not?

"A. Yes, upon the margin of the river, I said "whose sewage flows into the river."†

Mr. WILLIAM BULMER, examined May 4th, 1875.

"Q. 5331. You made a special survey up the river, and examined the condition of the river bed and source of supply, I believe, at three places, viz., Middleton-in-Teesdale, Barnard Castle, and Gainford?

"A. Yes.

"Q. 5332. What do you think of the bed of the river there?

"A. At Middleton-in-Teesdale there is a large quantity of sewage being poured into the river from various small drains, and at one place I saw on the banks that the refuse of an ashpit had been teamed down the sides of the bank, and at the bottom there was a ton still remaining.

"Q. 5333. Of solid refuse?

"A. Yes, direct from the ashpit. It was evidently a place constantly used for that purpose. I also saw a very large number of privies hanging over, and the refuse going direct into the Tees.

"Q. 5334. Do you think that a fit source of supply for the town of Middlesbrough?

"A. I have not drunk it since, so satisfied have I been in my own mind that it is not fit for use."‡

Scientific evidence was also given by Drs. Frankland, Odling, and Hill as to the dangers arising from water obtained from such a source as the River Tees, whilst their view was opposed by Drs. Letheby and others. In the end, the Committee refused to pass the preamble of the Bill.

In 1876 the Water Company promoted another Bill which was practically a revival of that of 1875 already referred to, and at the same time the Corporations of Stockton and Middlesbrough promoted another Bill, having for its object the compulsory purchase of the waterworks, together with a scheme which should fulfil the conditions which they had stated should be imposed upon the Water Company. This scheme provided for the construction in the Balder Valley of a supply reservoir having a capacity of upwards of 900,000,000 gallons, at Hury, which was to be fed, by the head waters of the rivers Balder and Lune, from a large catchment area in that neighbourhood; for the construction of reservoirs in the valleys of the Lune (Grassholm) and Balder (Blackton) respectively, to be used entirely as compensation reservoirs for those rivers; and for the construction of gravitation mains from the Hury reservoir to the towns. These two Bills were both referred to the same Committee of the House of Commons, and they occupied the attention of the Committee for 24 days, during which time a mass of evidence was adduced by the Corporations to show, amongst other things, the necessity of obtaining a water supply for domestic purposes from unpolluted sources. The chief contentions of the Corporations|| were—

(a.) "That the supply of such a necessity of life as water ought to be in the hands of the local authorities, and not in the hands of a company trading for profit."

(b.) "That the supply of water, for domestic purposes at least should be taken from a source which was free from any sewage or other pollution, and

(c.) "That no further quantity of water could, without danger, be taken from the river, than that which the Water Company was then taking, namely, 60,000,000 gallons per week."

The conclusions arrived at by the Committee were that the Bill of the Company should be rejected, and that of the Corporations passed. The contest was renewed before a Committee of the House of Lords, but after 14 days had been employed

* Stockton and Middlesbrough Water Bill. Evidence, &c., p. 377.

† Stockton and Middlesbrough Water Bill. Evidence, p. 405.

‡ Stockton and Middlesbrough Water Bill. Evidence, p. 360.

|| The Stockton and Middlesbrough Corporations' Waterworks, by Mr. D. D. Wilson. Proceedings of the Cleveland Institution of Engineers. Session 1887-88, page 138.

in receiving evidence on both sides, the Bill was eventually passed. By the Act it was provided that a joint Water Board should be appointed by the two Corporations, which should have power to purchase the works of the Water Company. For the construction of the new works a period of six years was, with certain exceptions allowed. The exceptions were the Grassholm Reservoir and its connexion with the Hury Reservoir. These works were allowed 10 years for their completion. In the Act it was also provided that the price to be given for the waterworks should be 25 years' purchase of the maximum dividend, namely, 18,647*l.*, which amounted to 466,175*l.*, together with "a sum to be fixed by arbitration in case of dispute" for "compulsory purchase and prospective value" of the undertaking, and certain other moneys, including all debts and liabilities of the Company. As the amount to be paid for prospective value was disputed, the Water Board having offered a sum of 5*l.* in settlement, the matter was submitted to arbitration, and the decision given by the umpire in 1878 was, that a sum of 213,802*l.* should be paid for "compulsory purchase and prospective value." In the end the amount paid to the Water Company was 802,956*l.*, and the total cost involved in this purchase, including parliamentary and arbitration expenses, amounted to 847,465*l.*, a sum upwards of a quarter of a million above that which the Corporation had anticipated having to pay. In addition to this, the staple trade of the district at this time was much depressed, and consequently there was a great falling off in the revenue obtained for water rents. As a result, the plans for the new works were laid aside, and it was not till 1882 that the Water Board were in a position to begin to purchase the land required for the proposed gravitation works, and not till 1884 that the contract for the Hury Reservoir was let. At the end of 1883 the Water Board promoted a Bill in Parliament in which they proposed to postpone the construction of the gravitation main and the reservoir in the Lune Valley until 1900, and in the meantime water was to be discharged from the Hury and Blackton reservoirs into the river to be pumped out again at Broken Scar. This Bill was opposed by riparian owners and others, and when it became an Act, in 1884, the time for completing the Hury Reservoir and the gravitation main was only extended to December 1890, and for the construction of the Blackton and Grassholm reservoirs to 31st December 1894. Under this Act also a provision was included whereby, until the completion of the Hury Reservoir on 31st December 1890, the quantity of water which might be pumped from the river was increased from 60,000,000 (to which it was limited under the Water Company's Act) to 66,000,000 gallons per week. In 1888 another application to Parliament was made, and an Act was obtained extending the time for the completion of the Blackton Reservoir and the gravitation main until 31st December 1894, and the Hury Reservoir until 31st December 1891, the Water Board being permitted to pump 66,000,000 gallons per week until the latter period, or for one year longer than under the Act of 1884. This Act also contained a provision permitting the Water Board to use the river bed as a means for bringing down the water from the Hury and Blackton reservoirs to the pumping station at Broken Scar instead of bringing it down in the gravitation main.

The arrangement under this Act as to the amount of water to be pumped from the river is as follows: On the completion of the Hury Reservoir, and until the construction of the gravitation main, the board has to discharge 2,325 gallons of compensation water into the River Balder, and for every additional 100 gallons discharged per minute, they are authorised to pump at Broken Scar 1,000,000 gallons per week in addition to the 60,000,000 gallons which they are entitled to take under the Water Company's Act of 1864. But the total quantity which may be taken is limited to 81,000,000 gallons per week.

In view of the evidence brought by the Corporations as to the polluted nature of the river as a source of water supply, evidence which no doubt to a large extent influenced Parliament in acceding to their demands for power to purchase compulsorily the waterworks from the old company, it is noteworthy to find that in 1888, 12 years later, owing to financial reasons, the water supply was still being obtained from the old source, and that in that year the Water Board should have found it necessary to bring into use engines capable of pumping from that source double as much water as could be pumped by the engines of the old company; and that in 1890, 14 years after the evidence as to the nature of the river water had been given, the average weekly pumpings from the river should amount to 63,620,000 gallons, as compared with a weekly average of 47,497,000 gallons in 1876, the year in which any additional pumping was strenuously opposed.

As regards the Darlington Urban Sanitary Authority, special investigations with regard to the pollution of the river were made in 1887, and copies of the reports of

Drs. Drury and Manson on the conditions observed at Barnard Castle; by Professor Hare on the biological examination of the Tees water; by Mr. W. F. K. Stock, the public analyst for the county of Durham, and by the late Professor Tidy on the chemical examination of the Tees water, will be found in Appendix H.

In conclusion, I have to acknowledge my indebtedness to the members and officers of the thirty-two sanitary authorities comprised within the area of the Inquiry, for their uniform courtesy and for valuable assistance given to me from time to time in my investigation. I have also to thank Professor Symons for the record of rainfall at Mickleton, Mr. Wells for that at Barnard Castle, Miss Dodgson for that at Whorlton, Mr. Tullett for that at Raby Castle, and Miss Pease for that at Darlington. To Mr. Hallam I am indebted for a copy of the Meteorological Records made at the Albert Park at Middlesbrough.

To the several medical officers of health and to the medical practitioners in the district, my thanks are especially due for much time and labour kindly placed at my disposal.

FREDERICK WILLIAM BARRY.

November, 1892.

APPENDICES.

A.—Return of houses supplied with water from the works of the Stockton and Middlesbrough Water Board.

B.—List of cases of Enteric Fever notified from day to day during the period 24th August 1890—21st March 1891, in each Sanitary District within the area of the Tees Inquiry, together with the source of water supply used in each instance.

C.—Return showing the amount of water pumped from the River Tees day by day during the six months ended 31st December 1890 at the Waterworks of the—

- (1.) Darlington Corporation ;
- (2.) Stockton and Middlesbrough Water Board.

D.—Topographical description of the River Tees from its source to the sea, by Professor Ansted.

E.—Meteorological and Rainfall Returns:—

- (1.) Register of rainfall kept at Mickleton in 1890 ;
- (2.) Do. do. Barnard Castle in 1890 ;
- (3.) Do. do. Whorlton in 1890 ;
- (4.) Do. do. Raby Castle, Staindrop, in 1890 ;
- (5.) Do. do. Southend, Darlington, in 1890 ;
- (6.) Do. do. Albert Park, Middlesbrough, in 1890 ;
- (7.) Meteorological Register kept at the Albert Park, Middlesbrough, for the four months ending October 31st, 1890.

F.—Abstract of the observations made by the Water Bailiffs of the Tees Salmon Fishery Board as to Floods in the Tees during 1890 :—

- (1.) Observations made by Inspector Mabon at Blackwell ;
- (2.) Observations made by Inspector Brunskill at Middleton One Row.

G.—Reports on Chemical Analyses of Tees Water made in 1890-91 :—

- (1.) Report by Mr. W. F. K. Stock on chemical analyses of (a) water taken from the River Tees at the intake of the Darlington Waterworks, and (b) of water from a tap in the town after having passed through the waterworks, in November 1890 ;
- (2.) Report by Mr. W. F. K. Stock on similar samples taken in January 1891 ;
- (3.) Report by Dr. Frankland on the chemical analysis of a sample of water collected in Middlesbrough in August 1890 ;
- (4.) Do. do. sample collected October 1890 ;
- (5.) Do. do. sample collected December 1890 ;
- (6.) Report by Mr. Allen do. do. October 1890 ;
- (7.) Report by Messrs. Pattinson and Stead do. do. ;
- (8.) Report by Mr. A. C. Wilson on the chemical and bacteriological examination of a sample of water collected at Stockton-on-Tees in August 1891.

H.—Reports made to the Corporation of Darlington in 1887 with reference to the pollution of the River Tees :—

- (1.) Report by Mr. Councillor Drury ;
 - (2.) Report by Mr. Councillor Manson ;
 - (3.) Extracts from a Report made by Dr. Hare on a bacteriological examination of the Tees water ;
 - (4.) Report by Mr. W. F. K. Stock on the chemical examination of the Tees water ;
 - (5.) Report by the late Professor Tidy.
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APPENDIX A.

HOUSES SUPPLIED WITH TEES WATER FROM THE WORKS OF THE
STOCKTON AND MIDDLESBROUGH WATER BOARD.

(a.) RETURN received from Mr. D. D. WILSON, the GENERAL MANAGER of STOCKTON and MIDDLESBROUGH WATER BOARD, showing the NUMBER of HOUSES supplied with WATER in various TOWNSHIPS from the WATERWORKS of the BOARD.

#		Ordinary Supply.	Supplies by Meter.	Total No. of Houses.
		No. of Houses.	No. of Houses.	
	Stockton - - - - -	9,002	96	9,098*
	South Stockton - - - - -	2,738	15	2,753*
	Norton - - - - -	533	12	545
	Haverton Hill - - - - -	252	—	252
	Port Clarence - - - - -	191	13	204
	Hartburn - - - - -	41	10	51
	Elton - - - - -	8	3	11
	Long Newton - - - - -	8	1	9
	Preston - - - - -	21	10	31
	Eaglescliffe Junction - - - - -	7	—	7
	Urley Nook - - - - -	9	—	9
	Eaglescliffe - - - - -	42	19	61
	Yarm - - - - -	376	2	378
	Fighting Cocks and Middleton One Row - - - - -	218	3	221
	Darlington - - - - -	19	—	19
	Little Stainton, <i>see note b.</i> - - - - -	1	—	1
	Billingham - - - - -	6	—	6
	Stillington - - - - -	—	155	155
	Middlesbrough - - - - -	13,712	85	13,797*
	North Ormesby - - - - -	1,449	2	1,451
	Cargo Fleet - - - - -	80	—	30
	South Bank - - - - -	<i>See Note a.</i>	25	25
	Eston - - - - -	303	140	443
	Grangetown - - - - -	866	2	868
	South Eston - - - - -	498	2	500
	Eston Grange - - - - -	24	—	24
	Lackeuby - - - - -	37	—	37
	Warrenby - - - - -	152	1	153
	Coatham (including Tod Point) - - - - -	535	19	554
		31,078	615	31,693

a. The water for South Bank is supplied in bulk through the Normanby Local Board.* The 25 houses in this place supplied by meter, are supplied through the Cargo Fleet Iron Company.

b. The houses at Stillington are supplied through the Carlton Iron Company.

* *See Return (b) in this Appendix.*

(b.) RETURN received from Mr. S. SPRY, the CLERK to the NORMANBY LOCAL BOARD, showing the NUMBER of HOUSES supplied with WATER in the DISTRICT with TEES WATER through that BOARD.

SOUTH BANK.—1,422 houses—being all the houses in this part of the Board's district.

NORMANBY VILLAGE.—48 houses out of 266 supplied with water by the Board, the remainder have private wells.

* As regards these Sanitary Districts the figures respecting "houses supplied" will be observed to be in excess of the figures of total houses at Census, as given in Table XXVI, page 42. As mentioned in the footnote on page 41, the Census figures as to houses, and consequently as to populations, in these districts were adopted as bases of Fever rates.

APPENDIX B.

CASES OF ENTERIC FEVER REPORTED TO HAVE OCCURRED IN THE AREA OF
THE TEES INQUIRY (24th August 1890—21st March 1891).

LIST of CASES of ENTERIC FEVER notified from DAY to DAY during the Period 24th August 1890 to 21st March 1891, in the several SANITARY DISTRICTS comprised within the AREA of the TEES INQUIRY.

Notified during Fortnight ending	Sanitary District.	Date of Notification.	Address.	Initials of Patient.	Sex.	Age.	Primary.	Secondary.	Water Supply obtained from
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1890. Sept. 6	Teesdale, Rural	1890. —	Nil.	—	—	—	—	—	—
	Barnard Castle, Urban.	Sept. 6	Newgate - -	E. B.	F.	22	1	—	Barnard Castle Waterworks.
	Auckland, Rural	—	Nil.	—	—	—	—	—	—
	Bishop Auckland, Urban.	—	Nil.	—	—	—	—	—	—
	Shildon, Urban	Sept. 5	51, Hildyard Terrace, New Shildon.	F. B.	M.	32	1	—	Weardale and Shildon Water Company.
	Spennymoor, Urban.	—	Nil.	—	—	—	—	—	—
	Darlington, Urban.	Sept. 4	19, Hargreave Terrace, S.	W. R.	M.	18	1	—	Darlington Corporation Waterworks.
		" 6	Old Dog and Gun Cottages, E.	A. E. P.	M.	12	1	—	Well.
		Aug. 30	36, Dickinson Street, E. -	W. L. K.	M.	9	1	—	Darlington Corporation Waterworks.
	Darlington, Rural	—	Nil.	—	—	—	—	—	—
	Stockton-on-Tees, Urban.	Aug. 31	14, Cross Carrol Street, S.E.	M. G.	F.	18	1	—	Stockton and Middlesbrough Water Board.
		Sept. 1	54, Lawson Street, W.E. -	T. H. H.	M.	18	1	—	" "
		" 2	5, Bright Street, E. -	J.	M.	36	1	—	" "
		" 2	90, Lawson Street, W.E. -	J. A. H.	F.	18	1	—	" "
		" 2	10, Mill Street, C. -	M. C.	F.	34	1	—	" "
		" 2	26, Perey Street, Pa. -	T. B.	M.	21	1	—	" "
		" 2	102, Tilery Road, E. -	C. H. B.	M.	18	1	—	" "
		" 5	15, Leybourne Terrace, W.E.	M. M.	F.	10	—	1	" "
		" 3	19, Light Pipe Hall, W.E.	K. H.	M.	15	1	—	" "
		" 3	Portrack Grange, Po. -	F. A. J.	M.	8	1	—	" "
		" 3	6, Railway Cottages, C. -	A. McL.	M.	14	1	—	" "
		Aug. 30	13, Byron Street, N.W. -	L. V.	F.	8	1	—	" "
	Stockton, Rural	Sept. 1	Cambridge Terrace, Norton.	K.	?	5	1	—	" "
		Aug. 27	Wilkinson's Yard, Norton	R.	M.	25	1	—	" "
		Sept. 4	4, Clarence Cottages, Haverton Hill.	E. W.	F.	23	1	—	" "
	Sedgefield, Rural	—	Nil.	—	—	—	—	—	—
	Hartlepool, Urban.	—	Nil.	—	—	—	—	—	—
	West Hartlepool, Urban.	Sept. 5	38, Park Street - -	C. F.	?	16	1	—	Well.
	Hartlepool, Rural	—	Nil.	—	—	—	—	—	—
	Northallerton, Urban.	—	Nil.	—	—	—	—	—	—
	Northallerton, Rural	—	Nil.	—	—	—	—	—	—
	Stokesley, Rural	—	Nil.	—	—	—	—	—	—

Notified during Fortnight ending	Sanitary District.	Date of Notification.	Address.	Initials of Patients.	Sex.	Age.	Primary.	Secondary.	Water Supply obtained from
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1890. Sept. 20 —cont.	Darlington, Urban—cont.	1890. Sept. 16	66, Brunswick Street, C. -	W. S.	M.	17	1	—	Darlington Corporation Water Works.
		" 18	58, Brunswick Street, C. -	J. W.	F.	21	1	—	" "
		" 19	25, Wooler Street, C. -	M. M.	F.	5 $\frac{1}{2}$	1	—	" "
		" 19	26, Brunswick Street, C. -	J. W. H.	M.	9 $\frac{1}{2}$	1	—	" "
		" 19	8, Alliance Street, C. -	R. T. D.	M.	5	1	—	" "
		" 10	13, Adelaide Street, E. -	M. E. W.	F.	13	1	—	" "
		" 10	4, Louisa Street, E. -	L. S.	F.	21	1	—	" "
		" 11	5, Carlton Street, E. -	W. B.	M.	20	1	—	" "
		" 11	68, Yarm Road, E. -	J. C.	M.	38	1	—	" "
		" 11	2, Ridsdale Street, E. -	J. P.	M.	33	1	—	" "
		" 12	68, Yarm Road, E. -	J. C.	M.	15	—	1	" "
		" 12	8, Silver Street, E. -	J. H. T.	M.	10	1	—	" "
		" 12	22, Green Street, E. -	M. J. F.	F.	23	1	—	" "
		" 15	41, Dickinson Street, E. -	J. K.	M.	4	1	—	" "
		" 16	Old Dog and Gun Cottages, Neatham Road, E.	E. P.	F.	45	—	1	Well.
		" 16	Old Dog and Gun Cottages, Neatham Road, E.	A. P.	F.	7	—	1	"
		" 17	21, St. John's Creseent, E.	J. P.	F.	45	1	—	Darlington Corporation Waterworks.
		" 18	4, Silver Street, E. -	J. A.	M.	17	1	—	" "
		" 13	63, Stanhope Road, W. -	F. P.	F.	20	1	—	" "
		" 15	8, Printing House Sq., W.	J. N.	M.	15	1	—	" "
		" 15	12, Wyeombe Street, W. -	W. P.	M.	14	1	—	" "
		" 15	27, Powlet Street, W. -	T. L.	M.	7	1	—	" "
		" 17	4, East Raby Street, W. -	T. B. N.	M.	14	1	—	" "
		" 17	17, West Powlet Street, W.	R. H.	F.	10	1	—	" "
		" 17	Carmel Road, W. -	B. H.	F.	22	1	—	" "
		" 18	48, Outram Street, W. -	H. C. S.	M.	9	1	—	" "
		" 18	28, Ontram Street, W. -	C. A. D.	M.	15 $\frac{1}{2}$	1	—	" "
		" 18	28, Ontram Street, W. -	F. E. D.	F.	11 $\frac{1}{2}$	—	1	" "
		" 13	40, Whessoe Lane, N. -	A. M.	F.	15	1	—	" "
		" 13	5, Shildon Street, N. -	C. A.	M.	17	1	—	" "
		" 13	54, Shildon Street, N. -	G. B.	M.	7	1	—	" "
		" 17	46, Gurney Street, N. -	M. T.	F.	12	1	—	" "
		" 18	1, North Road, N. -	A. S. W.	F.	22	1	—	" "
		" 19	12, Henry Street, N. -	S. A.	F.	17	1	—	" "
		" 9	46, Model Place, S. -	MeA.	F.	16	1	—	" "
		" 11	1, Backhouse Street, S. -	A. E.	F.	22	1	—	" "
		" 13	83, Victoria Road, S. -	M. K.	F.	11	1	—	" "
		" 15	42, Hargreave Terrace, S.	E. S.	M.	11	1	—	" "
		" 15	1, Waverley Terrace, S. -	L. K.	M.	20	1	—	" "
		" 15	1, Waverley Terrace, S. -	G. P.	M.	14	1	—	" "
		" 16	11, Swan Street, S. -	A. W.	M.	25	1	—	" "
		" 17	9, Pensbury Street, S. -	R. W. F.	M.	16	1	—	" "
		" 17	67, Hargreave Terrace, S.	J. W.	M.	9	1	—	" "
		" 11	2, Maude Street, N.W. -	L. F.	F.	8	1	—	" "
		" 11	26, Easson Road, N.W. -	J. P.	M.	17	1	—	" "
		" 15	32, Four Riggs, N.W. -	A. H.	F.	23	1	—	" "
		" 16	13, Gladstone Street, N.W.	W. H. T.	M.	13	1	—	" "
		" 18	45, Albion Street, N.W. -	A. J. J.	M.	14	1	—	" "
		" 18	6, King Street, N.W. -	M. J. D.	F.	13	1	—	" "
	Darlington, Rural	" 9	Coekerton - - -	J. A.	M.	42	1	—	" "
		" 13	Killinghall - - -	M. J.	F.	46	1	—	Stoekton and Middlesbrough Water Board.
		" 15	School Ayeliffe - - -	W. C.	M.	66	1	—	Well.
		" 18	Coekerton - - -	W. A. B.	M.	7	1	—	Darlington Corporation Waterworks.
		" 20	Killinghall - - -	B. S.	F.	12	1	—	Stoekton and Middlesbrough Water Board.
	Stoekton-on-Tees, Urban.	" 20	Coatham Mundeville* -	A. E.	M.	19	1	—	Stoekton and Middlesbrough Water Board, and Well.
		" 7	93, Parliament Street, Pa.	L.	F.	24	1	—	Stoekton and Middlesbrough Water Board.
		" 8	30, Cardigan Street, N.W.	E. E.	F.	16	1	—	" "
		" 8	17, Paradise Row, S.E. -	J. R. W.	M.	7	1	—	" "
		" 8	17, Paradise Row, S.E. -	W. W.	M.	22	1	—	" "
		" 9	33, Lindsay Street, Pa. -	A. J. E.	F.	5	1	—	" "
		" 9	44, Sheraton Street, W.E.	D. D.	F.	15	1	—	" "
		" 9	58, Chalk Street, Pa. -	A. E. W.	F.	14	1	—	" "
		" 9	West End Terrace, S.W. -	J. G.	M.	40	1	—	" "
		" 10	19, Alberto Street, N.W.	J. P.	M.	21	1	—	" "
		" 10	25, Brunswick Street, E. -	A. P.	M.	20	1	—	" "
		" 10	1, Manfield Street, W.E. -	E. U.	F.	12	1	—	" "
		" 10	30, Webster Street, W.E.	H. I.	M.	18	1	—	" "
		" 10	21, Headlam Street, T. -	A. E. D.	F.	6	1	—	" "
		" 11	18, Lorne Street, W.E. -	G. A. N.	F.	11	1	—	" "
		" 11	11, Selwin Street, Pa. -	E. W.	F.	6	1	—	" "
		" 11	34, Thistle Green, S.E. -	L. W.	F.	42	1	—	" "
		" 12	Humbles Yarm Lane, Pa.	E. R.	F.	24	1	—	" "
		" 12	14, Russell Street, E. -	C. B.	M.	25	1	—	" "
		" 12	50, Hill Street, V. -	C. E. C.	M.	12	1	—	" "

* Imported case.

Notified during Fortnight ending	Sanitary District.	Date of Notification.	Address.	Initials of Patient.	Sex.	Age.	Primary.	Secondary.	Water Supply obtained from
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1890. Sept. 20 —cont.	Stockton-on-Tees, Urban—cont.	1890. Sept. 13	35, Jane Street, T. -	A. H.	M.	19	1	—	Stockton and Middlesbrough Water Board.
		" 13	3, Francis Street, N.W. -	G. H.	M.	18	1	—	" "
		" 13	17, Paradise Row, S.E. -	E. W.	F.	8	—	1	" "
		" 13	8, Smithfield, S.E. -	T. W.	M.	27	1	—	" "
		" 13	13, Alberto Street, N.W. -	M. S.	F.	13	1	—	" "
		" 15	10, Mitre Street, Pa. -	M. S.	F.	47	1	—	" "
		" 15	Clephan's Yard, S.E. -	W. H.	M.	23	1	—	" "
		" 15	12, Catholic Street, V. -	H. A.	M.	28	1	—	" "
		" 15	21, Alberto Street, N.W. -	W. E.	M.	1	1	—	" "
		" 16	2, Ellicot Street, Pa. -	C. T. V.	M.	38	1	—	" "
		" 16	8, Derby Street, Yarm Lanc, S.W.	J. L.	M.	20	1	—	" "
		" 16	15, Lawson Street, W.E. -	H. P. H.	M.	23	1	—	" "
		" 16	19, Joseph Street, Po. -	M. B.	F.	11	1	—	" "
		" 16	7, St. Ann's Terrace, Port- rack, Po.	W. L.	F.	17	1	—	" "
		" 16	20, Spring Street, S.W. -	E. T. D.	M.	22	1	—	" "
		" 16	62, Brunswick Street, E. -	E. R.	F.	12	1	—	" "
		" 16	54, Adderley Street, S.W. -	T. G.	M.	12	1	—	" "
		" 16	2, Dean Street, W.E. -	J. W. H.	M.	19	1	—	" "
		" 16	76, Light Pipe Hall Road, W.E.	M. A. S.	F.	14	1	—	" "
		" 17	1, Lindsay Street, Pa. -	J. B.	M.	50	1	—	" "
		" 17	31, Lorne Street, W.E. -	J. P.	M.	29	1	—	" "
		" 18	12, Haswell Street, T. -	J. P.	M.	8	1	—	" "
		" 18	8, Clarence Terrace, N.W. -	O. H.	M.	22	1	—	" "
		" 20	2, Airton, C. -	J. H.	M.	13	1	—	" "
		" 20	2, Airton, C. -	N. H.	F.	10	—	1	" "
		" 20	10, Thorpe Street, V. -	E. A. R.	F.	8	1	—	" "
		" 20	27, Thompson Street, N.W. -	A. R.	F.	71	1	—	" "
		" 20	12, Back Henzel Street, N.W.	B. S.	F.	7	1	—	" "
		" 20	23, Clarence Street, N.W. -	N.	M.	6	1	—	" "
		" 20	1, Manfield Street, W.E. -	M. U.	F.	4	—	1	" "
		" 20	28, Percy Street, Pa. -	L. P.	M.	34	1	—	" "
	Stockton, Rural	" 7	Haverton Hill - -	P.	?	16	1	—	" "
		" 17	Clarence Cottages, Haver- ton Hill.	A. B.	M.	11	1	—	" "
		" 17	nr. Chapel Haverton - -	J. A.	M.	21	1	—	" "
		" 17	Manhood Place - -	H. G.	M.	19	1	—	" "
		" 17	Clarence Street - -	S.	F.	14	1	—	" "
		" 7	1, Port Clarence - -	F. C.	M.	24	1	—	" "
	Sedgefield, Rural	" 12	Cornforth Lane - -	E. W.	F.	41	1	—	Weardale and Shildon Water Co.
	Hartlepool, Urban	" 12	10, Kinburn Street - -	W.	?	2	1	—	Hartlepool Water Co.
		" 12	7, Frederick Street - -	G.	F.	27	1	—	" "
		" 16	21, Albion Street, Mid- dleton.	B.	M.	4	1	—	" "
	West Hartlepool, Urban.	" 8	Shanton Square - -	A. F.	?	10	1	—	Well. Hartlepool Water Co.
		" 15	Charlotte Street - -	A. F.	?	17	1	—	" "
		" 20	Charlotte Street - -	D. L.	?	24	1	—	" "
	Hartlepool, Rural	—	Nil.	—	—	—	—	—	—
	Northallerton, Urban.	—	Nil.	—	—	—	—	—	—
	Northallerton, Rural.	—	Nil.	—	—	—	—	—	—
	Stokesley, Rural	—	Nil.	—	—	—	—	—	—
	Middlesbrough, Urban.	Sept. 7	12, Elm Street, M. -	F. B.	M.	5	1	—	Stockton and Middles- brough Water Board.
		" 8	8, Short Street, M. -	W. W.	M.	14	1	—	" "
		" 8	45, Lower East Street, N.E.	J. W.	F.	39	1	—	" "
		" 9	17, Walker Street, N.W. -	W. J.	M.	17	1	—	" "
		" 10	59, Westward Street, W. -	H. S.	M.	4	1	—	" "
		" 10	89, Corporation Road, N.E.	J. B.	M.	30	1	—	" "
		" 10	155, Stockton Street, W. -	W. F.	M.	19	1	—	" "
		" 10	160, Grange Road East, M.	L. D.	F.	26	1	—	" "
		" 11	25, Ru-hford Street, S. -	R. A. C.	M.	21	1	—	" "
		" 11	29, Leannox Street, M. -	W. S.	M.	20	1	—	" "
		" 12	13, Garden Street, W. -	M. L. P.	F.	8	1	—	" "
		" 12	80, Marton Road, N.E. -	A. J. B.	F.	40	1	—	" "
		" 13	5, Olive Street, W. -	J. W. M.	M.	15	1	—	" "

Notified during Fortnight ending	Sanitary District.	Date of Notification.	Address.	Initials of Patient.	Sex.	Age.	Primary.	Secondary.	Water Supply obtained from
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1890. 20 Sept. —cont.	Middlesbrough Urban—cont.	1890. Sept. 13	Old Zetland Hotel, Commercial Street, N.W.	G. D.	F.	19	1	—	Stockton and Middlesbrough Water Board.
		" 13	35, Thomas Street, N.W.	M. A. R.	F.	10	1	—	" "
		" 13	9, Childers Street, N.W.	A. S.	F.	14	1	—	" "
		" 13	24, Adam Street, N.W.	J. F.	M.	38	1	—	" "
		" 13	21, Watson Street, M.	P. B.	M.	34	1	—	" "
		" 14	47, Wye Street, N.E.	R. F.	M.	11	1	—	" "
		" 15	29, Argyle Street, M.W.	W. H.	M.	22	1	—	" "
		" 15	135, Duncombe Street, N.W.	J. B.	M.	29	1	—	" "
		" 15	31, Gauntlet Street, N.W.	D. E. T.	M.	17	1	—	" "
		" 15	39, Henry Street, N.W.	J. W.	M.	4	1	—	" "
		" 15	18, Marl Street, N.E.	L. K.	F.	23	1	—	" "
		" 15	1, Balgison's Yard, N.E.	P. K.	M.	15	1	—	" "
		" 15	30, Mineral Street, N.E.	J. R.	M.	23	1	—	" "
		" 15	97, Lower Commercial Street, N.E.	A. C.	M.	5	1	—	" "
		" 15	87, Hunter Street, N.E.	M. J.	F.	17	1	—	" "
		" 15	50, Laws Street, N.W.	S. G.	M.	18	1	—	" "
		" 15	58, Lincoln Street, N.W.	T. D.	M.	31	1	—	" "
		" 15	37, Newport Road, N.W.	J. G. B.	M.	10	1	—	" "
		" 16	Grove Hill, S.	W.	F.	21	1	—	" "
		" 16	11, Lime Street, N.W.	E. T.	F.	20	1	—	" "
		" 16	14, Balder Street, N.E.	W. D.	M.	13	1	—	" "
		" 16	27, Norton Street, M.	J. B.	M.	17	1	—	" "
		" 16	66, Derwent Street, N.W.	W. F.	M.	45	1	—	" "
		" 16	34, Pearson Street, N.W.	C. T.	M.	22	1	—	" "
		" 16	36, Corporation Road, M.	C. M.	F.	15	1	—	" "
		" 16	8, Bright Street, M.	R. H.	M.	7	1	—	" "
		" 17	24, Adam Street N.W.	A. J.	F.	31	—	1	" "
		" 17	5, Dalkin Street, N.W.	M. M.	F.	18	1	—	" "
		" 18	122, Marsh Road, N.W.	A. F.	F.	18	1	—	" "
		" 18	20, Severn Street, N.E.	J. H.	M.	10	1	—	" "
		" 18	63, Argyle Street, N.W.	W. H. J.	M.	6	1	—	" "
		" 18	29, Cargo Fleet Road, N.E.	J. W. S.	F.	17	1	—	" "
		" 18	23, Buxton Street, M.	G. P.	M.	20	1	—	" "
		" 18	16, Bolekow Street, W.	A. J.	M.	15	1	—	" "
		" 18	27, Buxton Street, M.	S. B.	M.	20	1	—	" "
		" 18	Gordon Terrace, S.	G. R.	M.	39	1	—	" "
		" 18	3, Mount Street, M.	H. W.	M.	19	1	—	" "
		" 18	69, North Ormesby Road, N.E.	W. T. P.	M.	37	1	—	" "
		" 18	18, Peel Street, W.	E. S.	F.	24	1	—	" "
		" 18	74, Dunning Street, M.	H. C. H.	M.	15	1	—	" "
		" 18	22, Vaughan Street, W.	H. R.	F.	18	1	—	" "
		" 18	Newport Creseent, W.	E. C.	F.	18	1	—	" "
		" 18	Newport Creseent, W.	G. C.	M.	20	—	1	" "
		" 18	45, Hutchinson Street, N.W.	J. D.	F.	6	1	—	" "
		" 18	10, Alexandria Street, N.W.	J. T. B.	M.	10	1	—	" "
		" 19	1, Carlton Street, S.	J. S.	M.	20	1	—	" "
		" 19	51, Station Street, W.	B. B.	F.	16	1	—	" "
		" 19	70, Speneer, Street, N.W.	M. C.	F.	21	1	—	" "
		" 19	42, Garden Street, W.	A. C.	M.	23	1	—	" "
		" 19	35, West Street, W.	P. T.	M.	28	1	—	" "
		" 19	22, Linthorpe Mews, M.	I. C.	M.	25	1	—	" "
		" 19	46, Samuelson Street, N.W.	J. O. C.	M.	17	1	—	" "
		" 19	119, Grange Road East, M.	C. B.	F.	12	1	—	" "
		" 20	11, Hartington Road, W.	E. C.	F.	7	1	—	" "
		" 20	155, Grange Road East, M.	A. T.	M.	17	1	—	" "
		" 20	87, Marton Road, M.	A. A. D.	F.	15	1	—	" "
		" 20	7, Ingledew's Buildings, W.	S. G.	F.	10	1	—	" "
		" 20	43, Inness Street, N.W.	T. W.	M.	15	1	—	" "
		" 20	6, Atkinson Street, M.	H. W.	F.	31	1	—	" "
		" 20	35, Adam Street, N.W.	R. B.	M.	30	1	—	" "
		" 20	64, Farrer Street, N.W.	R. R.	F.	14	1	—	" "
	South Stockton Urban.	" 10	20, Leonard Street	H. S.	M.	28	1	—	" "
		" 11	44, Mandale Road	G. S. A.	M.	25	1	—	" "
		" 11	75, Queen Street	I. H. L.	M.	20	1	—	" "
		" 12	20, Leonard Street	M. A. S.	F.	47	—	1	" "
		" 15	31, Bridge Street	H. W.	M.	14	1	—	" "
		" 15	81, Cobden Street	I. E. T.	M.	15	1	—	" "
		" 16	3, Gilmour Street	P. W.	F.	7	1	—	" "
		" 17	19, Barnard Street	R. S.	M.	41	1	—	" "
		" 18	20, Leonard Street	I. S.	M.	14	—	1	" "
		" 19	29, Barnard Street	H. M.	F.	8	1	—	" "
		" 19	66, Queen Street	W. R.	M.	7	1	—	" "
		" 19	17, Barnard Street	I. S. R.	M.	5	1	—	" "
		" 20	20, Leonard Street	G. S.	M.	43	—	1	" "
	Ormesby Urban	" 8	64, Stovin Street	A. E. D.	F.	13½	1	—	" "
		" 16	11, Trinity Terrace	J. W.	M.	35	1	—	" "
		" 13	29, King's Road	W. H. H.	M.	14	1	—	" "
		" 8	39, King's Road	W. H.	M.	61	1	—	" "
		" 15	32, Harrison Street	P. S.	M.	28	1	—	" "

Notified during Fortnight ending	Sanitary District.	Date of Notification.	Address.	Initials of Patient.	Sex.	Age.	Primary.	Secondary.	Water Supply obtained from
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1890. 20 Sept. —cont.	Ormesby, Urban —cont.	1890. Sept. 17	61, Telford Street	- A. W.	M.	24	1	—	Stockton and Middlesbrough Water Board
		" 12	56, Nelson Street	- W. C.	M.	27	1	—	
		" 17	28, King's Road	- F. W. H.	M.	15	1	—	
		" 11	61, Alfred Street	- M. I. T.	M.	3	1	—	
	Normanby, Urban	" 8	6, Coral Street, S.B.	- H. T.	F.	11	1	—	" "
		" 9	31, North Street, S.B.	- W. C.	M.	18	1	—	" "
		" 10	39, West Street	- J. H. W.	M.	23	1	—	Stockton and Middlesbrough Water Board and well.
		" 10	7, Coral Street, S.B.	- L. F.	F.	15	1	—	
		" 11	13, Middlesbrough Road, S.B.	R. L. J.	M.	6	1	—	Stockton and Middlesbrough Water Board.
		" 12	31, North Street, S.B.	- J. C.	M.	40	—	1	" "
		" 15	33, Napier Street, S.B.	- P. G.	M.	23	1	—	" "
		" 20	12, Diamond Street, S.B.	- T. W.	M.	28	1	—	" "
		" 20	10, Nelson Street, S.B.	- J. B.	M.	33	1	—	" "
		" 20	19, Connaught Street, S.B.	M. M. W.	F.	7	1	—	" "
		" 20	85, North Street, S.B.	- C. A. S.	F.	9	1	—	" "
		" 20	37, Cleveland Street, S.B.	I. W. R.	M.	22	1	—	" "
	Eston, Urban -	" 15	3, Alexandra Terrace, South Bank.	W. C.	M.	20	1	—	" "
		" 19	35, Stapylton Street, Grange-town.	J. McC.	M.	18	1	—	" "
		" 20	Keeper's House, Grange-town.	J. H.	M.	40	1	—	" "
		" 20	Eston Grange Farm, Grange-town.	?	M.	22	1	—	" "
		" 20	56, Stapylton Street, Grange-town.	I. B.	M.	10	1	—	" "
		" 20	19, Bolekow Street, South Eston.	C. W. L.	M.	9	1	—	" "
	Middlesbrough, Rural	—	Nil.	—	—	—	—	—	—
	Kirkleatham, Urban.	Sept. 15	Warrenby	- J. W.	M.	25	1	—	Stockton and Middlesbrough Water Board.
	Redcar, Urban -	—	Nil.	—	—	—	—	—	
	Guisborough, Urban.	—	Nil.	—	—	—	—	—	
	Skelton and Brotton, Urban.	—	Nil.	—	—	—	—	—	
	Saltburn-by-the-Sea, Urban.	—	Nil.	—	—	—	—	—	
	Loftus, Urban -	—	Nil.	—	—	—	—	—	
	Guisborough, Rural.	Sept. 7	26, Low Lackenby	- R. W.	M.	18	1	—	Stockton and Middlesbrough Water Board.
	Richmond, Urban	—	Nil.	—	—	—	—	—	
	Richmond, Rural	—	Nil.	—	—	—	—	—	
4 Oct. -	Teesdale, Rural	—	Nil.	—	—	—	—	—	
	Barnard Castle, Urban.	Oct. 1	Bede Kirk*	- H.	F.	30	1	—	Darlington Corporation Waterworks and well.
	Auckland, Rural	Sept. 22	Rosemount Terrace, Crook	T.	?	29	1	—	
		" 22	Gladstone Street, Crook	B.	?	15	1	—	Waskerley Water Co.
		" 22	Gladstone Street, Crook	B.	?	11	—	1	
		" 22	Wilkie Square, Crook	L.	?	16	1	—	
		" 22	High Hope Street, Crook	C.	?	23	1	—	
		" 22	High Hope Street, Crook	R.	?	20	1	—	
		" 22	High Hope Street, Crook	H.	?	18	1	—	
		" 22	High Hope Street, Crook	T.	?	?	1	—	
		" 22	Albert Street, Crook	R.	?	19	1	—	
		" 22	Albert Street, Crook	K.	?	14	1	—	
		" 22	Mill Street, Crook	D.	?	15	1	—	
		" 22	Wilson Street, Crook	L.	?	?	1	—	
		" 22	Nelson Street, Crook	L.	?	51	1	—	
		" 29	Grahamsley, Crook	J.	?	20	1	—	
		" 29	Grahamsley, Crook	P.	?	?	1	—	
		" 29	Grahamsley, Crook	W.	?	?	1	—	
		" 29	Institute Terrace, Crook	D.	?	14	1	—	

* Removed from Darlington to district when suffering from fever.

Notified during fortnight ending	Sanitary District.	Date of Notification.	Address.	Initials of Patient.	Sex.	Age.	Primary.	Secondary.	Water Supply obtained from
1.	2.	3.	4.	5.	5.	6.	8.	9.	10.
1890. Oct. 4 —cont.	Bishop Auckland, Urban.	1890. Sept. 28	12, High Tenters Street -	E. W.	F.	4	1	—	Bishop Auckland Waterworks.
		" 28	Wiseman's Yard, High Tenter Street.	R. R.	M.	23	1	—	" "
		Oct. 1	Flintoff Street -	B.	M.	23	1	—	" "
		" 1	South Church Lane -	R.	F.	70	1	—	" "
	Shildon, Urban.	Sept. 28	Association Street, Old Shildon.*	G. Y.	F.	55	1	—	Weardale and Shildon Waterworks Co.
	Spennymoor, Urban.	" 28	32, Carnes Street -	G. P.	M.	?	1	—	Waskerley Water Co.
	Darlington, Urban.	" 24	Crown Street, C. -	A. C.	F.	22	1	—	Darlington Corporation Waterworks.
		" 22	1 Florence Street, E. -	J. McN.	M.	19	1	—	" "
		" 22	17, Dickinson Street, E. -	F. I.	M.	9	1	—	" "
		" 22	26, Dickinson Street, E. -	E. K.	M.	11½	1	—	" "
		" 23	31, Louisa Street, E. -	J. W.	M.	37	1	—	" "
		" 24	43, Green Street, E. -	A. Y.	M.	28	1	—	" "
		" 25	Carter's Row, E. -	C. R.	M.	9	1	—	" "
		" 25	Carter's Row, E. -	E. N.	F.	7	1	—	" "
		" 25	9, Lucknow Street, E. -	A. S.	F.	12	1	—	" "
		" 22	7, Barnard Street, W. -	R. H. W.	M.	28	1	—	" "
		" 22	Pierremont Crescent, W. -	R. S.	M.	35	1	—	" "
		" 24	20, Winston Street, W. -	J. T. B.	M.	30	1	—	" "
		" 25	42, East Raby Street, W. -	G. E. S.	M.	29	1	—	" "
		" 26	16, Wycombe Street, W. -	J. W.	F.	18	1	—	" "
		" 23	Whesoe Lane, N. -	J. T.	M.	61	1	—	" "
		" 25	12, Zetland Street, N. -	J. M.	M.	18	1	—	" "
		" 25	1, Hammer Street, N. -	B. A. W.	F.	22	1	—	" "
		" 25	12, Fry Street, N. -	D. C.	M.	21	1	—	" "
		" 23	51, Beaumont Street, S. -	L. H.	F.	8	1	—	" "
		" 24	10, Church Street, S. -	M. A. M.	F.	14	1	—	" "
		" 24	Ledd Yard, S. -	E. O.	F.	70	1	—	" "
		" 22	6, North Terrace, N.W. -	J. H. P.	F.	39	1	—	" "
		" 25	45, Dodd's Street, N.W. -	M. B.	F.	6½	1	—	" "
		" 27	9, Railway Terrace, E. -	F. W.	M.	22	1	—	" "
		" 27	6, Belgrave Street, E. -	J. W.	F.	14	1	—	" "
		" 27	41, Dickinson, Street, E. -	T. S.	M.	22	—	1	" "
		" 29	27, Belgrave Street, E. -	J. N.	M.	10	1	—	" "
		" 29	9, Stanley Street, E. -	E. P.	F.	15	1	—	" "
		" 30	29, Bright Street, E. -	A. P.	M.	8	1	—	" "
		Oct. 1	5, Stanley Street, E. -	R. W.	F.	18	1	—	" "
		" 4	Fever Hospital, E. -	E. B.	F.	17	1	—	" "
		Sept. 27	13, Mount Street, C. -	J. F. S.	M.	35	1	—	" "
		" 30	West Brook Villas, C. -	C. S.	M.	14	1	—	" "
		Oct. 4	33, Beaumont Street, S. -	W. H.	M.	3	1	—	" "
		Sept. 27	16, Outram Street, W. -	T. P. R.	M.	7	1	—	" "
		" 30	91, Stanhope Road, W. -	K. R.	F.	4½	1	—	" "
		Oct. 2	16, Outram Street, W. -	M. R.	M.	5	—	1	" "
		Sept. 30	2, Jackson's Yard, Bondgate, N.W. -	S. J. B.	F.	10	1	—	" "
		Oct. 1	25, Greenbank Road, N.W. -	C. W. T.	M.	1½	1	—	" "
		" 2	45, Queen Street, N.W. -	T. W. W.	M.	6	1	—	" "
		" 2	29, Union Row, N.W. -	M. H.	M.	40	1	—	" "
		Sept. 30	5, North Road, N. -	C. L.	M.	8½	1	—	" "
		Oct. 1	16, William Street, N. -	M. H.	F.	14	1	—	" "
		" 2	21, Lansdowne Street, N. -	H. N.	M.	19	1	—	" "
		" 2	17, Sheraton Street, N. -	A. McG.	F.	20	1	—	" "
	Darlington, Rural	Sept. 24	Cockerton -	F. S.	F.	5	1	—	" "
		" 25	Killinghall -	N. A. M.	F.	66	1	—	Stockton and Middlesbrough Water Board.
		" 25	Heighington† -	F. W.	M.	17	1	—	Darlington Corporation Waterworks and well.
		" 26	Whesoe -	J. H.	M.	19	1	—	Darlington Corporation Waterworks.
		Oct. 1	Great Aycliffe -	J. E. R.	M.	13	1	—	Well.
		" 1	Killinghall -	R. B. H.	M.	81	1	—	Stockton and Middlesbrough Water Board.
		" 2	Houghton-le-Skearne -	J. C.	M.	41	1	—	Well.
		" 4	Hurworth -	I. G.	F.	9	1	—	" "
	Stockton - on Tees, Urban.	Sept. 22	20, Portrack Lane, S.E. -	T. E.	M.	24	1	—	Stockton and Middlesbrough Water Board.
		" 22	50, Elliot Street, Po. -	P. McG.	M.	23	1	—	" "
		" 23	29, Suffolk Street, W.E. -	L. M.	F.	6½	1	—	" "
		" 23	55, Sydney Street, E. -	L. W.	F.	22	1	—	" "
		" 23	48, Craister Street, T. -	L. E.	F.	13	1	—	" "
		" 23	41, Hume Street, N.W. -	F. B.	M.	8	1	—	" "
		" 23	19, Carlisle Street, T. -	C. R. C.	M.	9	1	—	" "

* Patient in Darlington prior to illness.

† Imported case.

Notified during Fortnight ending	Sanitary District.	Date of Notification.	Address.	Initials of Patient.	Sex.	Age.	Primary.	Secondary.	Water Supply obtained from
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1890. Oct. 4 —cont.	Stockton on Tees, Urban— cont.	1890. Sept. 23	Ivy House, Bridge Road, S.E.	J. A. S.	M.	12	1	—	Stockton and Middlesbrough Water Board.
		" 23	21, Atkinson Street, C. -	M. B.	F.	9	1	—	" "
		" 23	17, Paradise Row, S.E. -	M. E. W.	F.	18	—	1	" "
		" 23	44, Stanley Street, E. -	J. R. N.	M.	1	1	—	" "
		" 23	42, Hill Street West, V. -	T. P.	M.	34	1	—	" "
		" 24	25, Temple Street, T. -	M. R.	M.	29	1	—	" "
		" 24	73, Garbutt Street, V. -	W. J. C.	M.	21	1	—	" "
		" 24	Workhouse, Po. -	R. S.	M.	47	1	—	" "
		" 24	6, Croft Street, V. -	A. M.	F.	9	1	—	" "
		" 25	11, Herbert Street, Po. -	F. G.	M.	21	1	—	" "
		" 25	9, Bone Street, N.W. -	R. T.	F.	35	1	—	" "
		" 25	3, Elm Street, S.E. -	A. J.	F.	9	1	—	" "
		" 26	11, Ward Place, W.E. -	M. A. F.	F.	10	1	—	" "
		" 26	3, Back Dobbing Street, N.W.	M.	M.	24	1	—	" "
		" 26	96, Pearson Street, Pa. -	F. H.	M.	26	1	—	" "
		" 27	9, Elliott Street, Pa. -	M. E. T.	F.	10	1	—	" "
		" 27	27, William Street, E. -	W. R. W.	F.	2	1	—	" "
		" 27	97, Parliament Street, Pa. -	H. W.	M.	2	1	—	" "
		" 27	11, Sun Street, S.W. -	A. C.	M.	12	1	—	" "
		" 27	16, Moss Street, T. -	E. T.	M.	17	1	—	" "
		" 27	5, Routledge Street, Po. -	J. D. H.	M.	17	1	—	" "
		" 28	30, Pearson Street, Pa. -	E. R.	F.	15	1	—	" "
		" 29	5, Stewart Street, T. -	W. C.	M.	10	1	—	" "
		" 29	17, Tennant Street, C. -	E. M. L.	F.	17	1	—	" "
		" 29	14, Beaumont Street, V. -	E. C.	F.	13	1	—	" "
		" 29	12, Bright Street, E. -	S. I.	M.	21	1	—	" "
		" 29	14, East Street, C. -	D. S.	F.	14	1	—	" "
		" 29	14, East Street, C. -	L. S.	F.	2	—	1	" "
		" 29	14, Albion Street, E. -	B. M. J.	M.	12	1	—	" "
		" 29	70, Lawson Street, W.E. -	J. R.	M.	24	1	—	" "
		" 30	14, Melville Street, T. -	C. B.	M.	28	1	—	" "
		" 30	10, Melville Street, T. -	A. G.	M.	29	1	—	" "
		" 30	21, Thompson Street, N.W. -	G. R.	M.	13	1	—	" "
		" 30	13, Lawson Street, W.E. -	E. W.	F.	6	1	—	" "
		" 30	29, Sheraton Street, W.E. -	T. B.	M.	24	1	—	" "
		" 30	11, Melville Street, T. -	M. E. A.	F.	6	1	—	" "
		" 30	30, Langley Street, C. -	P. M.	M.	2	1	—	" "
		" 30	20, William Street, E. -	E. M.	F.	17	1	—	" "
		" 30	13, Barrett Street, Po. -	T. W. W.	M.	10	1	—	" "
		" 30	20, Brown Street, V. -	W. S.	M.	29	1	—	" "
		" 30	44, Joseph Street, Po. -	W. G.	M.	25	1	—	" "
		Oct. 1	34, Paradise Street, S.E. -	R. B.	F.	17	1	—	" "
		" 1	32, Gayless Street, W.E. -	J. G.	M.	25	1	—	" "
		" 1	Springholme, S.W. -	M. P.	F.	24	1	—	" "
		" 1	9, Dean Street, W.E. -	E. V.	F.	20	1	—	" "
		" 1	4, Cass Street, W.E. -	M. S.	F.	7	1	—	" "
		" 2	60, Cromwell Street, V. -	M. O.	F.	7	1	—	" "
		" 2	27, Hartington Road, W.E. -	E. A. B.	F.	23	1	—	" "
		" 2	6, Railway Cottages, Stamp Street, C. -	M. McL.	F.	52	—	1	" "
		" 2	74, Tilery Road, T. -	A. M. A.	F.	22	1	—	" "
		" 3	31, Biekersteth Street, Pa. -	M. M. P.	F.	6	1	—	" "
		" 3	27, Hutchinson Street, E. -	E. L.	F.	3	1	—	" "
		" 3	29, Bowser Street, V. -	M. F.	M.	27	1	—	" "
		" 3	35, Jane Street, T. -	J. T. H.	M.	17	—	1	" "
		" 3	3, Walter Street, S.W. -	W. L.	M.	7	1	—	" "
	Stockton, Rural	Sept. 24	19, Ash Street, Haverton	J. P.	M.	21	1	—	" "
		" 28	Port Clarence -	M. McC.	M.	24	1	—	" "
		" 23	Norton -	E. P.	F.	27	1	—	" "
		" 25	Railway Cottages, Port Clarence.	E. W.	F.	27	1	—	" "
		Oct. 1	17, Elm Street, Haverton Hill.	J. H. M.	M.	28	1	—	" "
		Sept. 27	42, Port Clarence -	T. C.	M.	40	1	—	" "
		" 30	27, Port Clarence -	J. C.	M.	23	1	—	" "
		" 30	24, New Houses, Port Clarence.	J. S.	M.	19	1	—	" "
		Oct. 4	45, Oak Street, Haverton Hill.	J. C.	M.	12	1	—	" "
		" 3	14 Ash Street, Haverton Hill.	E. L.	?	22	1	—	" "
		" 3	27, Oak Street, Haverton Hill.	J. C. F.	M.	16	1	—	" "
		Sept. 27	Haverton Hill -	W. P.	M.	30	1	—	" "
	Sedgefield, Rural	" 25	Trimdon Colliery -	M. L.	F.	16	1	—	Deep well.
	Hartlepool, Urban.	" 22	9, Baptist Street -	S.	M.	16	1	—	Hartlepool Water Co.
		" 22	7, Back Frederick Street	R.	F.	7	1	—	" "
	West Hartlepool, Urban.	" 23	Iframley Street -	E. B.	?	18	1	—	" "
		" 27	Regent Street -	C. McN.	?	8	1	—	" "
		" 28	Edwin Street -	S. B.	?	5	1	—	" "

Notified during Fortnight ending	Sanitary District.	Date of Notification.	Address.	Initials of Patient.	Sex.	Age.	Primary.	Secondary.	Water Supply obtained from
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1890. Oct. 4--- cont.	Hartlepool, Rural	1890. —	Nil.	—	—	—	—	—	—
	Northallerton, Urban	—	Nil.	—	—	—	—	—	—
	Northallerton, Rural.	—	Nil.	—	—	—	—	—	—
	Stokesley, Rural	Sept. 23	Queen's Hotel, Middlesbrough (removed to Stokesley).	S.	?	19	1	—	Stockton and Middlesbrough Water Board.
	Middlesbrough, Urban.	" 21	23, Shakespeare Street, M.	J. D.	M.	23	1	—	" "
		" 21	64, Spencer Street, N.W.	J. D.	M.	8	1	—	" "
		" 22	51, Lincoln Street, N.W.	S. B.	F.	10	1	—	" "
		" 22	61, Kendal Street, N.W.	J. A. G.	F.	21	1	—	" "
		" 22	33, Lloyd Street, N.W.	R. W.	M.	13	1	—	" "
		" 22	58, Westward Street, W.	N. McK.	M.	6	1	—	" "
		" 22	75, Denmark Street, N.W.	F. E.	F.	4	1	—	" "
		" 22	33, Dundas Mews, M.	J. T. C.	M.	11	1	—	" "
		" 22	67, Glebe Road, S.	M. G.	F.	22	1	—	" "
		" 22	13, Leven Street, N.E.	C. W.	M.	13	1	—	" "
		" 22	155, Grange Road East, M.	H. T.	M.	8	—	1	" "
		" 23	9, Durham Street, N.E.	I. M.	M.	17	1	—	" "
		" 23	68, Cannon Street, N.W.	W. W.	M.	51	1	—	" "
		" 23	63 Station Street, W.	W. E.	M.	14	1	—	" "
		" 23	56, Italy Street, S.	H. B.	M.	18	1	—	" "
		" 23	45, Unthank Street, N.W.	W. S.	M.	25	1	—	" "
		" 23	6, Gough Street, S.	J. L.	M.	23	1	—	" "
		" 23	33, Station Street, W.	J. B.	M.	6	1	—	" "
		" 24	1, Stansfield Street, N.W.	M. G.	M.	4	1	—	" "
		" 24	56, Bulmer Street, N.W.	J. McK.	M.	24	1	—	" "
		" 24	68, Calthorpe Street, N.W.	J. W. H.	M.	24	1	—	" "
		" 24	44, Walker Street, N.W.	F. S.	M.	38	1	—	" "
		" 24	14, Pearson Street, N.W.	W. C.	M.	24	1	—	" "
		" 24	87, Earnest Street, S.	N. B.	F.	16	1	—	" "
		" 24	19, Innes Street, N.W.	E. R.	F.	19	1	—	" "
		" 24	2, Smith Street, W.	A. M. L.	F.	14	1	—	" "
		" 25	34, Sutherland Street, W.	A. C.	F.	17	1	—	" "
		" 25	221, Cannon Street, N.W.	J. G. G.	M.	17	1	—	" "
		" 25	81, Grange Road East, M.	A. S.	M.	18	1	—	" "
		" 25	Convent Newlands, M.	M. McK.	F.	15	1	—	" "
		" 25	61, Lumley Street, M.	M. E. A.	F.	15	1	—	" "
		" 25	62, Millbank Street, N.W.	J. A. W.	F.	15	1	—	" "
		" 25	50, Gladstone Street, N.W.	A. A.	M.	16	1	—	" "
		" 26	12, Princes Street, W.	A. H.	F.	40	1	—	" "
		" 26	3, Baltie Yard, N.E.	H. P.	M.	9	1	—	" "
		" 26	33, Johnson Street, W.	N. S.	F.	3	1	—	" "
		" 27	40, Oak Street, M.	G. G.	M.	29	1	—	" "
		" 27	109, Barrett Street, M.	A. H.	M.	12	1	—	" "
		" 27	260, Cannon Street, N.W.	W. B.	M.	12	1	—	" "
		" 27	2, Millbank Street, N.W.	T. N.	M.	13	1	—	" "
		" 27	122, Newport Road, W.	R. M.	M.	12	1	—	" "
		" 28	35, Granville Street, N.W.	A. N.	M.	27	1	—	" "
		" 28	9, Lord Street, N.W.	M. H.	F.	31	1	—	" "
		" 28	9, Lord Street, N.W.	J. H.	M.	10	—	1	" "
		" 28	23, Emily Street, M.	J. G.	M.	7	1	—	" "
		" 29	160, Grange Road East, M.	L. M.	F.	25	1	—	" "
		" 29	41, Francis Street, N.W.	E. M.	M.	20	1	—	" "
		" 29	31, Sidney Street, N.W.	T. M.	M.	43	1	—	" "
		" 29	57, Burke Street, W.	E. H.	M.	13	1	—	" "
		" 29	48, Hartington Road, W.	R. D.	M.	15	1	—	" "
		" 29	86, Monkland Street, W.	J. M.	F.	21	1	—	" "
		" 29	36, Bank Street, N.W.	E. H.	F.	16	1	—	" "
		" 29	15, Stanley Street, N.W.	J. S.	M.	24	1	—	" "
		" 29	54, Millbank Street, N.W.	T. L.	M.	21	1	—	" "
		" 29	84, Millbank Street, N.W.	R. T.	F.	29	1	—	" "
		" 30	175, Grange Road East, M.	S. H.	F.	22	1	—	" "
		" 30	8, Scaley Street, N.E.	E. W.	F.	9	1	—	" "
		" 30	47, Davison Street, W.	S. J. M.	F.	13	1	—	" "
		" 30	29, Montrose Street, M.	E. A.	F.	7	1	—	" "
		" 30	21, Fletcher Street, M.	L. B.	F.	28	1	—	" "
		" 30	9, West Street, W.	E. B.	F.	22	1	—	" "
		" 30	91, Calthorpe Street, N.W.	M. W.	M.	15	1	—	" "
		Oct. 1	34, Willow Street, M.	J. H.	M.	26	1	—	" "
		" 1	29, Severn Street, N.E.	I. H.	F.	11	1	—	" "
		" 1	20, Cargo Fleet Road, N.E.	G. McM.	F.	16	1	—	" "
		" 1	15, Short Street, M.	R. R.	M.	30	1	—	" "
		" 1	16, Unthank Street, N.W.	T. P.	M.	16	1	—	" "
		" 1	Woodlands, M.	R. S.	M.	14	1	—	" "
		" 1	Woodlands, M.	G. S.	M.	7	—	1	" "
		" 1	35, Thomas Street, W.	J. W. R.	M.	20	1	—	" "

Notified during Fortnight ending	Sanitary District.	Date of Notification.	Address.	Initials of Patient.	Sex.	Age.	Primary.	Secondary.	Water Supply obtained from
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1890. Oct. 4— <i>cont.</i>	Middlesbrough, Urban— <i>cont.</i>	1890. Oct. 2	13, Richmond Street, W.	M. McC.	F.	30	1	—	Stockton and Middlesbrough Water Board.
		" 2	172, Grange Road East, M.	T. H.	M.	17	1	—	
		" 2	34, Pearson Street, N.W.	M. T.	F.	25	—	1	
		" 2	71, Marsh Street, N.W.	T. McQ.	M.	30	1	—	
		" 3	35, Thomas Street, W.	C. R.	F.	12	—	1	
		" 3	35, Thomas Street, W.	G. R.	F.	8	—	1	
		" 3	23, Jamieson Street, N.W.	M. M.	F.	13	1	—	
		" 3	Jewish Synagogue, Brentnall Street.	M. D.	F.	10	1	—	
		" 3	11, Rock Street, N.E.	A. B.	M.	8	1	—	
		" 3	61, Wood Street, N.E.	J. T. P.	M.	8	1	—	
		" 3	51½, Richmond Street, W.	H. H.	M.	16	1	—	
		" 3	42, Spence Street, N.W.	M. J.	F.	65	1	—	
		" 3	51, Millbank Street, N.W.	G. R. A.	M.	7	1	—	
		" 3	51, Millbank Street, N.W.	J. W. A.	M.	5	1	—	
		" 4	47, Disraeli Street, N.W.	F. S.	F.	28	1	—	
		" 4	34, Frances Street, N.W.	F. W. G.	M.	11	1	—	
		" 4	21, Short Street, M.	M. B.	F.	54	1	—	
		" 4	124, Grange Road East, M.	H. J.	F.	14	1	—	
		" 4	14, Bulmer Street, N.W.	J. D.	M.	10	1	—	
		" 4	69, Westward Street, W.	J. W.	M.	33	1	—	
		" 4	40, Hill Street, W.	J. H.	M.	35	1	—	
		" 4	56, Newport Road, W.	W. A.	M.	33	1	—	
		" 4	6, Church Street, S.	A. S.	M.	22	1	—	
		" 4	40, Florence Street, N.W.	G. M.	M.	10	1	—	
	South Stockton, Urban.	Sept. 21	1, Cuthbert Street	M. D.	F.	19	1	—	
		" 21	67, Mandale Road	B. F.	F.	12	1	—	
		" 21	11, Barnard Street	M. A. N.	F.	24	1	—	
		" 22	Albert Inn, Thornaby Road.	H.	F.	29	1	—	
		" 22	Westbury Street	C.	F.	25	1	—	
		" 21	30, Caledonian Street	E. P.	F.	20	1	—	
		" 22	12, Cleveland Street	J. R. A.	M.	6	1	—	
		" 25	49, Gilmour Street	E. H.	F.	22	1	—	
		" 25	Mandale Road	G. E. C. D.	M.	25	1	—	
		" 26	8, Derby Street	I. C.	M.	5	1	—	
		" 26	6, Derby Street	W. L.	M.	10	1	—	
		" 28	17, Barnard Street	F. R.	M.	3	—	1	
		" 29	13, Caledonian Street	E. S.	F.	20	1	—	
		Oct. 1	21, New Street	S. H.	F.	13	1	—	
		" 2	1, Cobden Street	W. L.	M.	28	1	—	
		" 3	64, Gilmour Street	F. M.	F.	9	1	—	
		" 3	21, Mandale Road	W. R.	M.	12	1	—	
		" 4	23, Georgiana Street	L. M.	F.	9	1	—	
	Ormesby, Urban	Sept. 24	13, Harrison Street	J. C.	M.	12	—	1	Well.
		" 23	31, Queen Street	P. McD.	M.	40	1	—	
		" 29	118, Stevenson Street	M. L.	F.	14	1	—	
		" 22	3, Church Street	J. T.	M.	21	1	—	
		" 26	14, Alfred Street	W. R.	M.	15	1	—	
		" 24	68, Stovin Street	W. G.	M.	21	1	—	
		" 23	26, High Street	P. F.	M.	21	1	—	
		" 25	11, Bargate Street	B. G.	F.	14	1	—	
		" 26	24, Leven Street	L. N.	F.	21	1	—	
		" 29	78, Stevenson Street	P. F.	M.	30	1	—	
		" 21	12, Worsley Street	A. B.	F.	28	1	—	
	Normanby, Urban.	" 24	5, Garden Place, Normanby.	W. H.	M.	29	1	—	Stockton and Middlesbrough Water Board.
		" 24	21, Cleveland Street, Normanby.	F. B.	M.	27	1	—	
		" 26	30, Napier Street, South Bank.	J. B.	M.	19	1	—	
		" 27	16, Upper Millbank, South Bank.	T. S.	M.	4	1	—	
		" 27	34, Redeur Road, South Bank.	M. T.	F.	13	1	—	
		" 27	29, Princes Street, South Bank.	M. M.	M.	22	1	—	
		" 28	47, North Street, South Bank.	T. McC.	M.	22	1	—	
		" 28	37, Upper Millbank, South Bank.	A. O.	M.	6	1	—	
		" 29	5, Garden Place, Normanby.	W. W.	M.	3	—	1	
		" 29	12, Lambton Street, Normanby.	E. H.	M.	7	1	—	Well.
		" 29	20, Wear Street, South Bank.	T. R.	M.	20	1	—	
									Stockton and Middlesbrough Water Board.

Notified during Fortnight ending	Sanitary District.	Date of Notification.	Address.	Initials of Patient.	Sex.	Age.	Primary.	Secondary.	Water Supply obtained from
1.	2.	3.	4.	5.	6.	6.	7.	8.	10.
1890. Oct. 4— cont.	Normanby, Urban—cont.	1890. Sept. 30	27, North Street, South Bank.	T. G.	M.	23	1	—	Stockton and Middlesbrough Water Board.
		Oct. 1	14, Emerald Street, South Bank.	E. J. B.	F.	4	1	—	" "
		" 1	21, Millbank Street, South Bank.	C. A. H.	F.	6	1	—	" "
		" 3	63, West Terrace, South Bank.	J. T.	M.	15	1	—	" "
		" 4	37, Oxford Street, South Bank.	R. B.	M.	17	1	—	" "
		" 4	19, Upper Jackson Street, South Bank.	F. H.	F.	13	1	—	" "
		" 4	44, Princes Street, South Bank.	J. C.	M.	10	1	—	" "
		" 4	9, Upper Millbank, South Bank.	W. B.	M.	3	1	—	" "
		" 4	41, Upper Millbank, South Bank.	W. B.	F.	5	1	—	" "
		" 4	14, Station Terrace, South Bank.	B.	F.	23	1	—	" "
		" 4	32, North Street, South Bank.	R. P.	M.	22	1	—	" "
	Eston, Urban	Sept. 22	5, Bolekow Street, South Eston.	A. C.	M.	14	1	—	" "
		" 24	67, William Street, South Eston.	A. S.	M.	4	1	—	" "
		" 24	21, Miles Street, South Bank.	E. T.	M.	21	1	—	" "
		" 24	15, Beacham Street, South Bank.	M. K.	F.	23	1	—	" "
		" 24	15, Beacham Street, South Bank.	J. K.	M.	3	1	—	" "
		" 24	15, Beacham Street, South Bank.	A. K.	F.	1½	1	—	" "
		" 26	57, Wood Street, Grange-town.	H. H.	M.	28	1	—	" "
		" 26	25, Laing Street, Grange-town.	L. W.	F.	7	1	—	" "
		" 26	12, Holden Street, Grange-town.	O. B.	M.	18	1	—	" "
		" 27	11, Bessemer Street, Grange-town.	T. L.	M.	21	1	—	" "
		" 28	16, Holden Street, Grange-town.	R. P.	M.	20	1	—	" "
		" 28	70, Laing Street, Grange-town.	A. C.	M.	22	1	—	" "
		" 29	Wellington Hotel, Eston	W. C. B.	M.	13	1	—	Well.
		" 30	Miners Arms Hotel, Eston.	P. J.	F.	18	1	—	Stockton and Middlesbrough Water Board.
		" 30	97, Bessemer Street, Grange-town.	A. O. N.	M.	22	1	—	" "
		Oct. 1	1, William Street, Eston	A. C.	M.	8	1	—	" "
		" 2	9, Peel Street, South Bank	E. C.	M.	30	1	—	" "
		" 2	13, Vaughan Street, Grange-town.	J. H.	M.	19	1	—	" "
		" 2	40, Codd Street, South Bank.	N. T.	M.	13	1	—	" "
		" 2	22, Normanby Road, South Bank.	W. S.	M.	6	1	—	" "
		" 2	22, Normanby Road, South Bank.	T. S.	M.	29	—	1	" "
		" 4	91, High Street, South Eston.	L. C. W.	M.	25	1	—	Well.
		" 4	18, Bottomley's Road, South Eston.	I. W.	M.	30	1	—	Stockton and Middlesbrough Water Board
	Middlesbrough, Rural.	—	Nil.	—	—	—	—	—	—
	Kirkleatham, Urban.	Sept. 23	Queen Street, Coatham	R.	F.	14	1	—	Stockton and Middlesbrough Water Board.
		" 23	Neweome Street, Coatham	S. C.	M.	25	1	—	" "
		" 23	Neweome Street, Coatham	J. B.	F.	24	1	—	" "
		" 25	8, Teresa Terrace	E. V.	M.	1 yr. 9 mos.	1	—	" "
		Oct. 1	3, Coatham Villas	E. S.	F.	34	1	—	" "
	Redcar, Urban	" 4	4, Teresa Terrace	E.	F.	34	1	—	" "
		—	Nil.	—	—	—	—	—	—

Notified during Fortnight ending	Sanitary District.	Date of Notification.	Address.	Initials of Patient.	Sex.	Age.	Primary.	Secondary.	Water Supply obtained from
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1890. Oct. 4— cont.	Guisborough, Urban.	1890. —	Nil.	—	—	—	—	—	—
	Skelton and Brotton, Urban.	—	Nil.	—	—	—	—	—	—
	Saltburn-by-the-Sea, Urban.	—	Nil.	—	—	—	—	—	—
	Loftus, Urban -	—	Nil.	—	—	—	—	—	—
	Guisborough, Rural.	—	Nil.	—	—	—	—	—	—
	Richmond, Urban.	—	Nil.	—	—	—	—	—	—
	Richmond, Rural	—	Nil.	—	—	—	—	—	—
Oct. 18 -	Teesdale, Rural	Oct. 16	Gainford* - -	J. W. D.	M.	14	1	—	Darlington Corporation Waterworks.
	Barnard Castle, Urban.	—	Nil.	—	—	—	—	—	—
	Auckland, Rural	Oct. 8	Howdon-le-Wear -	S.	?	30	1	—	Waskerley Water Co.
		" 8	Moravian Street, Crook -	E.	?	18	1	—	" "
		" 8	Hope Street, Crook -	M.	?	52	1	—	" "
		" 8	Moralee Square, Crook -	J.	?	22	1	—	" "
		" 11	Albert Street, Crook -	R.	?	12	—	1	" "
		" 11	Gladstone Street, Crook -	A.	?	20	1	—	" "
		" 11	Rosemount, Crook -	H.	?	27	1	—	" "
		" 11	Rosemount, Crook -	R.	?	9	1	—	" "
		" 11	Rosemount, Crook -	R.	?	20	1	—	" "
		" 11	Stanley, Crook -	H.	?	16	1	—	" "
		" 18	Stanley, Crook -	H.	?	8	—	1	" "
		" 18	Stanley, Crook -	H.	?	40	—	1	" "
		" 18	Arthur Street, Crook -	B.	?	17	1	—	" "
		" 18	Hope Street, Crook -	S.	?	25	1	—	" "
	Bishop Auckland, Urban.	" 5	Back Way -	M. McC.	M.	40	1	—	Bishop Auckland Waterworks.
		" 18	South Church Lane -	R.	F.	70	—	1	" "
	Shildon, Urban	—	Nil.	—	—	—	—	—	—
	Spennymoor, Urban.	Oct. 18	13, Craddock Street -	T. B.	M.	?	1	—	Waskerley Water Co.
	Darlington, Urban.	" 9	38, Park Place, S. -	J. W. G.	M.	10	1	—	Darlington Corporation Waterworks.
		" 17	38, Park Place, S. -	A. G.	M.	17	—	1	" "
		" 6	14, Fern Street, E. -	J. H.	F.	15	1	—	" "
		" 6	14, Fern Street, E. -	A. M. H.	F.	11	—	1	" "
		" 6	14, Fern Street, E. -	A. H.	M.	6	—	1	" "
		" 8	East Terrace, E. -	A. K.	M.	15	1	—	" "
		" 13	Fever Hospital, E. -	W. S.	M.	4	—	1	" "
		" 13	Fever Hospital, E. -	G. M. P.	F.	6	—	1	" "
		" 13	Fever Hospital, E. -	F. L.	M.	15	—	1	" "
		" 13	Fever Hospital, E. -	L. J.	F.	5	—	1	" "
		" 13	31, Barton Street, E. -	A. W.	M.	3½	1	—	" "
		" 13	8, Fern Street, E. -	J. W. B.	M.	16	1	—	" "
		" 18	71, Grey Street, E. -	A. I.	M.	4	1	—	" "
		" 8	18, Farrar Street, C. -	T. B.	M.	20	1	—	" "
		" 11	1, East Street, C. -	T. S.	M.	17	1	—	" "
		" 13	5, Skerne Place, C. -	W. A.	M.	1½	1	—	" "
		" 9	8, Zetland Street, N. -	M. B.	F.	14	1	—	" "
		" 10	20, Janson Street, N. -	J. J.	M.	9½	1	—	" "
		" 6	25, Powlet Street, W. -	M. S.	F.	5	1	—	" "
		" 13	23, East Raby Street, W. -	E. B.	M.	6	1	—	" "
		" 14	8, Barnard Street, W. -	J. B.	M.	18	1	—	" "
		" 16	19, East Raby Street, W. -	E. A. A.	F.	4	1	—	" "
		" 18	Woodlands Road, W. -	E. A. M.	F.	28	1	—	" "
		" 7	26, Upper Arher Street, N.W.	M. J. G.	F.	26	1	—	" "
	Darlington, Rural.	" 6	Cockerton - -	M. S.	F.	7	—	1	" "
		" 8	Cockerton - -	J. T.	M.	62	1	—	" "

* Removed to district from Darlington when ill.

Notified during Fortnight ending	Sanitary District.	Date of Notification.	Address.	Initials of Patient.	Sex.	Age.	Primary.	Secondary.	Water Supply obtained from
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1890. Oct. 18— cont.	Stockton-on-Tees Urban.	1890. Oct. 5	16, Lawson Street, W.E.	N. C.	M.	5	1	—	Stockton and Middlesbrough Water Board.
		" 5	6, Ward's Place, W.E.	I. S.	F.	49	1	—	" "
		" 5	17, Albion Street, E.	E. H.	F.	30	1	—	" "
		" 5	27, Lawson Street, V.E.	M. G.	F.	6	1	—	" "
		" 5	41, Alliance Street, S.W.	L. N.	M.	29	1	—	" "
		" 5	14, Henzel Street, N.W.	R. H.	F.	14	1	—	" "
		" 5	22, Allee Street, E.	E. P.	M.	25	1	—	" "
		" 6	Portrack Grange, Po.	E. J.	F.	29	—	1	" "
		" 6	Portrack Grange, Po.	E. F.	F.	18	—	1	" "
		" 6	10, Croft Street, V.	H. H.	F.	15	1	—	" "
		" 6	Hume and Allison Street, C.	W. D. K.	M.	36	1	—	" "
		" 6	36, Maratime Street, S.E.	S. E. R.	F.	35	1	—	" "
		" 6	69, Parliament Street, Pa.	L. C. W.	M.	29	1	—	" "
		" 6	21, Alexander Street, W.E.	T. C.	M.	13	1	—	" "
		" 7	113, Tilery Road, T.	H. M.	F.	18	1	—	" "
		" 7	11, Hartington Road, W.E.	A. L.	F.	19	1	—	" "
		" 7	51, Cromwell Street, V.	J. S.	F.	14	1	—	" "
		" 7	33, Paradise Street, S.E.	J. M. A.	M.	8	1	—	" "
		" 7	45, Langley Street, C.	R. A.	M.	15	1	—	" "
		" 8	20, Rupert Street, Po.	J. W.	M.	5	1	—	" "
		" 8	33, Lindsay Street, Pa.	M. A. E.	F.	20	—	1	" "
		" 8	33, Lindsay Street, Pa.	E. E.	F.	10	—	1	" "
		" 8	11, Emannel Street, V.	T. T.	M.	26	1	—	" "
		" 8	10, Croft Street, V.	M. H.	F.	18	1	—	" "
		" 9	3, Constable's Yard, Thistle Green, S.E.	J. M.	M.	56	1	—	" "
		" 9	13, Wade Street, V.	A. F.	F.	22	1	—	" "
		" 9	27, Byron Street, N.W.	J. M.	M.	39	1	—	" "
		" 9	Unicorn Inn, S.E.	G. C. H.	M.	26	1	—	" "
		" 9	9, Templar Street, S.W.	J. C.	M.	29	1	—	" "
		" 9	11, Brunswick Street, E.	J. L. J.	M.	21	1	—	" "
		" 10	19, Albion Street, E.	R. H.	M.	12	1	—	" "
		" 11	St. Ann's Hill, Po.	G. F.	M.	13	1	—	" "
		" 11	31, Routledge Street, T.	J. P.	M.	40	1	—	" "
		" 11	55, Sydney Street, E.	W.	F.	22	—	1	" "
		" 11	1, Varo Street, S.E.	W. H. S.	M.	19	1	—	" "
		" 11	8, King Street, V.	L. R.	M.	9	1	—	" "
		" 11	22, Langley Street, C.	I. H.	F.	24	1	—	" "
		" 12	11, Queen Street, V.	M. J. E.	F.	34	1	—	" "
		" 12	17, Routledge Street, T.	V. A.	F.	5	1	—	" "
		" 13	27, Lambert Street, Po.	S. A.	F.	27	1	—	" "
		" 13	3, Elm Street, S.E.	F. R. J.	M.	7	1	—	" "
		" 13	17, Dean Street, W.E.	J. C.	M.	3	1	—	" "
		" 13	4, Ryan Street, V.	S. A. S.	F.	13	1	—	" "
		" 13	13, Shaftesbury Street, S.W.	T. E. A.	M.	40	1	—	" "
		" 14	Hartington Road, S.W.	B. H. C.	M.	4	1	—	" "
		" 14	5, James Street, S.E.	R. W.	M.	5	1	—	" "
		" 15	6, Shepherd Street, T.	M. S.	F.	55	1	—	" "
		" 15	27, Allison Street, C.	M. A.	F.	15	1	—	" "
		" 15	18, Wade Street, V.	C. S.	M.	9	1	—	" "
		" 16	26, Starkey Street, V.	R. D.	M.	18	1	—	" "
		" 16	29, Starkey Street, V.	R. W. W.	M.	39	1	—	" "
		" 16	28, Cardigan Street, N.W.	M. A. S.	F.	17	1	—	" "
		" 17	20, Lindsay Street, Pa.	J. H. W.	M.	11½	1	—	" "
		" 17	15, Light Pipe Hall Road, W.E.	A. E.	M.	6	1	—	" "
		" 18	2, Frederick Street, N.W.	E. J. K.	F.	29	1	—	" "
		" 18	8, Hume Street, N.W.	L. S.	F.	9	1	—	" "
		" 18	3, Vine Street, Pa.	M. J.	F.	12	1	—	" "
	Stockton, Rural	" 7	Norton - - -	C.	F.	19	1	—	" "
		" 5	Railway Cottages, Port Clarence.	M. C.	F.	34	1	—	" "
		" 5	48, New Houses, Port Clarence.	I. B.	M.	13	1	—	" "
		" 8	12, Ash Street, Haverton Hill.	W. H.	?	4	1	—	" "
		" 6	8, Morrison Street, Carlton Ironworks.	R. C.	M.	?	1	—	" "
		" 6	23, Church Street, Carlton Ironworks.	A. J.	M.	?	1	—	" "
		" 6	3, Church Street, Carlton Ironworks.	J. C.	M.	?	1	—	" "
		" 6	6, Church Street, Carlton Ironworks.	J. M.	M.	?	1	—	" "
		" 8	8, Metcalfe Street, Norton	J. T. H.	M.	21	1	—	" "
		" 11	9, Morrison Street, Carlton Ironworks.	T.	?	?	—	1	" "
		" 8	17, Morrison Street, Carlton Ironworks.	A. P.	F.	?	1	—	" "
		" 11	18, Elm Street, Haverton Hill.	W. O.	M.	36	1	—	" "

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1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1890. Oct. 18— cont.	Stockton, Rural —cont.	1890. Oct. 11	16, Elm Street, Haverton Hill.	S.A.W.	F.	31	1	—	Stockton and Middlesbrough Water Board.
		" 11	4, Ash Street, Haverton Hill.	S.M.	M.	25	1	—	
		" 8	9, Morrison Street, Carlton Ironworks.	T. T.	M.	?	1	—	
		" 13	19, Church Street, Carlton Ironworks.	S. J. C.	F.	?	1	—	
		" 13	27, Church Street, Carlton Ironworks.	E. T.	F.	?	1	—	
		" 13	9, Morrison Street, Carlton Ironworks.	T. W. H.	M.	?	—	1	
		" 13	57, Port Clarence	H.	M.	28	1	—	
		" 13	16, Ash Street, Haverton Hill.	M.	F.	21	1	—	
		" 18	6, Oak Street, Haverton Hill.	J. H.	M.	34	1	—	
		" 15	Haverton Hill	T.	M.	14	1	—	
	Sedgefield, Rural	—	Nil.	—	—	—	—	—	—
	Hartlepool, Urban.	Oct. 15	8, Olive Street	W.	M.	29	1	—	Hartlepool Water Co.
		" 15	8, Olive Street	W.	?	7	—	1	
	West Hartlepool, Urban.	" 7	Charlotte Street	L. W.	F.	9	1	—	"
		" 8	Burbank Street	E.	?	7	1	—	
		" 8	Burbank Street	E.	?	4	—	1	
		" 8	Burbank Street	E.	?	20	—	1	
		" 8	Burbank Street	E.	?	9	—	1	
		" 8	Burbank Street	E.	?	14	—	1	
		" 8	Burbank Street	E.	?	16	—	1	
		" 8	Burbank Street	E.	?	17	—	1	
		" 8	Burbank Street	E.	?	12	—	1	
		" 10	Garibaldi Street	G. B.	?	29	1	—	
		" 12	Studley Road	R. H.	?	20	1	—	
	Hartlepool, Rural	—	Nil.	—	—	—	—	—	—
	Northallerton, Urban.	—	Nil.	—	—	—	—	—	—
	Northallerton, Rural.	Oct. 18	Brompton	E. T.	F.	13	1	—	Well.
	Stokesley, Rural	" 14	Yarm	A. J. M.	F.	18	1	—	Stockton and Middlesbrough Water Board.
	Middlesbrough, Urban.	" 5	2, Brown's Yard, Station Street, W.	T. P.	M.	35	1	—	"
		" 5	271, Newport Road, N.W.	E. A. P.	F.	43	1	—	
		" 5	11, Melbourne Street, S.	E. S.	F.	4	1	—	
		" 5	9, Melbourne Street, S.	F. K.	M.	3	1	—	
		" 5	3, Elizabeth Street, N.W.	F. S.	F.	5	1	—	
		" 5	27, Hatherley Street, N.W.	J. A.	M.	20	1	—	
		" 5	70, Argyle Street, N.W.	A. H.	F.	22	1	—	
		" 6	79, Corporation Road, M.	A. K.	F.	40	1	—	
		" 6	34, Hartington Road, W.	G. P.	M.	10	1	—	
		" 6	10, Lamport Street, S.	T. B.	M.	32	1	—	
		" 6	6, Thorpe Street, N.W.	K. C.	F.	4	1	—	
		" 6	41, France Street, N.W.	M. F. P.	F.	4	—	1	
		" 6	Thornfield, Newlands, M.	H. T.	F.	1	1	—	
		" 7	154, Stockton Street, N.W.	L. R. J.	F.	7	1	—	
		" 7	15, Dale Street, W.	L. M.	F.	24	1	—	
		" 7	North Riding Infirmary, S.	F. F. J.	M.	21	1	—	
		" 7	North Riding Infirmary, S.	A. S.	F.	22	—	1	
		" 7	10, Millbank Street, N.W.	E. B.	F.	58	1	—	
		" 7	21, Millbank Street, N.W.	L. P.	F.	3	1	—	
		" 7	64, Spencer Street, N.W.	S. D.	F.	30	—	1	
		" 8	13, Childers Street, N.W.	S. Y.	M.	13	1	—	
		" 8	27, Bank Street, N.W.	A. E.	F.	23	1	—	
		" 8	97, Church Street, S.	J. R.	F.	20	1	—	
		" 8	53, Millbank Street, N.W.	H. W.	F.	16	1	—	
		" 8	7, Atkinson Street, M.	J. M.	M.	24	1	—	
		" 8	12, Raby Street, N.W.	R. R.	M.	21	1	—	
		" 8	27, Elder Street, M.	T. E.	M.	57	1	—	
		" 8	11, Duneombe Street, N.W.	J. C.	M.	18	1	—	
		" 8	9, William Street, W.	M. C.	F.	14	1	—	
		" 9	98, Spencer Street, N.W.	E. E.	F.	42	1	—	
		" 9	41, Alexandria Street, N.W.	S. J. W.	F.	19	1	—	
		" 9	40, Dundas Street, M.	M. E. N.	F.	8	1	—	

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1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1890. Oct. 18— cont.	Middlesbrough, Urban—cont.	1890. Oct. 10	26, Albert Street, M.	J. S.	M.	24	1	—	Stockton and Middlesbrough Water Board.
		" 10	16, Wilford Street, N.W.	W. D.	M.	28	1	—	
		" 10	Half Way House, Marton Road, S.	G. H. T.	M.	23	1	—	
		" 11	19, Lowe Street, N.W.	L. B.	F.	32	1	—	
		" 11	5, Graham Street, M.	E. E. E.	F.	35	1	—	
		" 11	27, Commercial Street, N.E.	J. B.	F.	40	1	—	
		" 13	130, Cannon Street, N.W.	W. A.	M.	45	1	—	
		" 13	7, Short Street, M.	H. J.	M.	5	1	—	
		" 13	13, Willow Street, M.	J. T. A.	M.	44	1	—	
		" 13	Southfield Villas, M.	G. D.	M.	16	1	—	
		" 13	45, France Street, N.W.	H. P.	F.	21	1	—	
		" 13	19, Mineral Street, N.E.	J. T.	M.	41	1	—	
		" 13	35, Buxton Street, M.	C. F.	M.	17	1	—	
		" 13	19, Farrer Street, N.W.	J. J.	M.	20	1	—	
		" 14	5, Newton Street, M.	T. V.	M.	22	1	—	
		" 14	2, Lumley Street, M.	J. A.	M.	28	1	—	
		" 14	11, Stansfield Street, N.W.	M. G.	M.	29	1	—	
		" 14	Tees Inn, Stockton Street, N.W.	J. D. B.	M.	36	1	—	
		" 14	31, Bowley Street, S.	J. F.	M.	18	1	—	
		" 14	7, Queen Mary Street, N.W.	E. S.	F.	27	1	—	
		" 15	91, Milton Street, S.	D. S.	M.	18	1	—	
		" 15	34, Dale Street, W.	W. B.	M.	38	1	—	
		" 15	18, Gauntlet Street, N.W.	R. E.	M.	37	1	—	
		" 15	14, Rockliffe Street, N.W.	R. E.	M.	32	1	—	
		" 15	14, Rockliffe Street, N.W.	M. E.	F.	29	—	1	
		" 15	20, Lincoln Street, N.W.	J. A. G.	M.	22	1	—	
		" 15	61, Kendal Street, N.W.	W. G.	M.	24	—	1	
		" 17	22, Garrett Street, S.	B. H.	F.	16	1	—	
		" 17	71, Arthur Street, N.W.	T. S.	M.	24	1	—	
		" 17	3, Taylor Street, W.	H. G.	F.	18	1	—	
		" 17	14, Randolph Street, N.W.	A. C.	M.	20	1	—	
		" 18	17, Farrer Street, N.W.	T. F.	M.	39	1	—	
		" 18	20, Bank Street, N.W.	S. E. C.	F.	30	1	—	
		" 18	7, Kendle Street, N.W.	H. A.	M.	25	1	—	
		" 18	60, Nelson Street, N.W.	J. W. W.	M.	9	1	—	
		" 18	5, Mason Place, W.	H. H.	M.	24	1	—	
		" 18	15, Goshen Street, N.W.	A. D.	F.	9	1	—	
		" 18	60, Buxton Street, M.	J. A. T.	F.	21	1	—	
	South Stockton, Urban.	" 6	7, Derby Terrace	E. D.	F.	9	1	—	
		" 6	10, Henrietta Street	M. A. C.	F.	6	1	—	
		" 7	21, Anderson Street	H. P.	M.	12	1	—	
		" 8	7, Mansfield Street	C. B.	F.	5	1	—	
		" 8	24, Barnard Street	J. L.	M.	20	1	—	
		" 14	4, Crosby Street	P. P.	M.	24	1	—	
		" 16	31, Chelmsford Street	S. A. H.	F.	22	1	—	
		" 18	26, York Street	M. B.	F.	32	1	—	
	Ormesby, Urban	" 18	12, Hope Street	M. C.	F.	16	1	—	
		" 6	11, Short Street	A. H.	M.	19	1	—	
		" 9	26, Alfred Street	A. N.	F.	4	1	—	
		" 14	4, Nelson Street	T. A.	M.	40	1	—	
		" 15	42, Bargate Street	J. B.	M.	19	—	1	
	Normanby, Urban.	" 15	42, Bargate Street	E. B.	F.	43	—	1	
		" 6	7, Princes Street, S.B.	T. M.	M.	13	1	—	
		" 6	14, James Street, S.B.	M. C.	F.	13	1	—	
		" 7	45, Upper Graham Street, S.B.	J. H.	M.	16	1	—	
		" 7	9, James Street, S.B.	T. B.	M.	21	1	—	
		" 16	57, Upper Graham Street, S.B.	J. D.	M.	5	1	—	
		" 16	57, Upper Graham Street, S.B.	M. D.	F.	9	—	1	
		" 16	25, Cleveland Street, S.B.	C. W.	M.	32	1	—	
		" 18	Jackson's Jetty	A. C.	F.	23	1	—	
	Eston, Urban	" 18	16, North Street, S.B.	F. C. T.	M.	19	1	—	
		" 6	90, Normanby Road, South Bank.	J. R.	M.	14	1	—	
		" 7	16, Beacham Street, South Bank.	J. J.	M.	7	—	1	
		" 7	6, Peel Street, South Bank.	P. H.	M.	19	1	—	
		" 7	14, Paley's Row, South Eston.	L. F.	F.	14	1	—	
		" 7	97, Bessemer Street, Grangetown.	J. M.	M.	22	—	1	

Notified during Fortnight ending	Sanitary District.	Date of Notification.	Address.	Initials of Patient.	Sex.	Age.	Primary.	Secondary.	Water Supply obtained from
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1890. Oct. 18— cont.	Middlesbrough, Rural.	—	Nil.	—	—	—	—	—	—
	Kirkleatham, Urban.	Oct. 13	4, Coatham Villas	J. J. C.	F.	22	1	—	Stockton and Middlesbrough Water Board.
	Redcar, Urban	—	Nil.	—	—	—	—	—	—
	Guisbrough, Urban.	—	Nil.	—	—	—	—	—	—
	Skelton and Brotton, Urban.	Oct. 17*	Yeoman Street, Skelton	W. W.	M.	40	1	—	Cleveland Water Co.
		" 17	Yeoman Street, Skelton	B.	?	6	1	—	" "
		" 17	North Skelton	M.	M.	31	1	—	" "
		" 17	North Skelton	E.	F.	32	1	—	" "
		" 17	North Skelton	S.	M.	7	1	—	" "
		" 17	North Skelton	B.	F.	62	1	—	" "
		" 17	North Skelton	B.	M.	16	—	1	" "
	Saltburn-by-the-Sea, Urban.	—	Nil.	—	—	—	—	—	—
	Loftus, Urban	—	Nil.	—	—	—	—	—	—
	Guisbrough, Rural.	Oct. 5	19, Low Lackenby	R. M.	M.	17	1	—	Stockton and Middlesbrough Water Board.
	Richmond, Urban	" 18	Market Place	†E. B.	F.	15	1	—	Richmond Corporation Water Works.
	Richmond, Rural	" 18	North Cowton	‡R. E.	M.	36	1	—	Well.
Nov. 1	Teesdale, Rural	—	Nil.	—	—	—	—	—	—
	Barnard Castle, Urban.	—	Nil.	—	—	—	—	—	—
	Auckland, Rural	Oct. 28	Churchill, Crook	G.	?	15	1	—	Waskerley Water Co.
		" 28	Longstaffe's Yard, Crook	H.	?	11	1	—	" "
		" 28	Longstaffe's Yard, Crook	H.	?	9	—	1	" "
		" 28	Gladstone Street, Crook	W.	?	38	1	—	" "
	Bishop Auckland, Urban	—	Nil.	—	—	—	—	—	—
	Shildon, Urban	—	Nil.	—	—	—	—	—	—
	Spennymoor, Urban.	—	Nil.	—	—	—	—	—	—
	Darlington, Urban.	Oct. 31	56, Parkgate, S.	F. W.	F.	15	1	—	Darlington Corporation Waterworks.
		" 21	6, Elmtree Street, N.	M. B.	M.	59	1	—	" "
		" 22	4, Temperance Place, N.W.	S. A. B.	F.	18	1	—	" "
		Nov. 1	63, Brunswick Street, C.	T. G. D.	M.	17	1	—	" "
	Darlington, Rural.	Oct. 22	Hurworth	A. E.	M.	36	1	—	Well.
		" 26	Black Banks	S.	M.	17	1	—	"
	Stockton - on - Tees, Urban.	" 19	56, St. Ann's Terrace, Po.	E. C.	F.	40	1	—	Stockton and Middlesbrough Water Board.
		" 19	14, Heuzel Street, N.W.	M. J. H.	F.	36	—	1	" "
		" 21	36, Webster Street, W.E.	W. D.	M.	40	1	—	" "
		" 21	1, Bright Street, E.	E. M.	F.	16	1	—	" "
		" 21	54, Adderley Street, Pa.	E. G.	M.	8	—	1	" "
		" 21	54, Adderley Street, Pa.	L. G.	M.	10	—	1	" "
		" 22	21, Exeter Street, N.W.	M. A. H.	F.	8	1	—	" "
		" 22	7, Light Pipe Hall Road, W.E.	A. N. S.	F.	5	1	—	" "
		" 22	9, Portrack Lane, V.	G. F.	M.	29	1	—	" "
		" 22	Baltic Tavern, Quay Side, S.E.	T. R.	F.	22	1	—	" "
		" 23	3, Christopher Street, T.	E. W.	F.	27	1	—	" "
		" 23	3, Christopher Street, T.	E. A. W.	F.	10mos.	—	1	" "
		" 23	3, Christopher Street, T.	A. W.	M.	3	—	1	" "
		" 23	29, William Street, E.	N. T.	F.	14	1	—	" "
		" 25	4, Neasham, V.	J. B. L.	M.	34	1	—	" "
		" 25	32, Hill Street, V.	J. W. H.	M.	4	1	—	" "
		" 27	89, Webster Street, W.E.	J. S.	M.	38	1	—	" "

* Were first heard of on date noted, but some had been ill for long time.

† This patient was frequently in Darlington and drank water from the Darlington Waterworks prior to his illness.

‡ Contracted the disease in Leeds.

Notified during Fortnight ending	Sanitary District.	Date of Notification.	Address.	Initials of Patient.	Sex.	Age.	Primary.	Secondary.	Water Supply obtained from
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1890. Nov. 1 —cont.	Stockton-on-Tees, Urban—cont.	1890. Oct. 27	17, Albion Street, E.	R. H.	M.	31	—	1	Stockton and Middlesbrough Water Board.
		" 27	7, Bay Street, S.E.	E. M. M.	F.	5	1	—	" "
		" 29	7, Oak Street, S.E.	S. S.	M.	22	1	—	" "
		" 29	11, Bone Street, N.W.	N. G.	M.	5	1	—	" "
		" 29	12, Back Henzel Street, N.W.	J. S.	F.	6	—	1	" "
		" 30	48, Sydney Street, S.E.	F. M. C.	F.	15	1	—	" "
		" 30	41, Thompson Street, N.W.	W. J.	M.	22	1	—	" "
		" 30	48, Sydney Street, S.E.	J. W. C.	M.	15	—	1	" "
		" 30	20, James Street, S.E.	J. C.	M.	20	1	—	" "
		" 31	28, Hume Street, N.W.	A. P.	M.	5½	1	—	" "
		" 31	17, Douglas Street, T.	G. F.	M.	27	1	—	" "
		" 31	2, Airtou Street, N.W.	A. H.	F.	8	—	1	" "
		" 31	3, Wade Street, V.	M. C.	F.	2½	1	—	" "
		Nov. 1	15, Nolan Street, C.	I. N.	F.	15	1	—	" "
	Stockton, Rural	Oct. 24	11, Oak Street, Haverton Hill.	B. W.	F.	57	1	—	" "
		" 25	30, Church Street, Carlton Ironworks.	J. P.	M.	30	1	—	" "
		" 21	Norton - - -	H.	?	?	1	—	" "
		" 29	19, Oak Street, Haverton Hill.	L. H.	F.	13	1	—	" "
		" 28	Norton - - -	J. G.	M.	24	1	—	" "
		Nov. 1	9, Oak Street, Haverton Hill.	W. D.	M.	22	1	—	" "
		Oct. 19	6, Railway Cottages -	E. F.	F.	9	1	—	" "
		" 19	6, Railway Cottages -	R. F.	M.	12	—	1	" "
	Sedgefield, Rural	—	Nil.	—	—	—	—	—	—
	Hartlepool, Urban.	Oct. 20	3, Lumley Square -	U.	F.	6	1	—	Hartlepool Water Co.
		" 20	4, Minerva Place -	L.	M.	13	1	—	" "
		" 28	5, Olive Street - -	L.	M.	5	1	—	" "
	West Hartlepool, Urban.	" 20	West Street - - -	G. A. H.	?	15	1	—	" "
		" 31	Gill Street - - -	A. H. F.	M.	16	1	—	" "
		Nov. 1	Conyers Street - -	N. A.	?	12	1	—	" "
	Hartlepool, Rural.	—	Nil.	—	—	—	—	—	—
	Northallerton, Urban.	—	Nil.	—	—	—	—	—	—
	Northallerton, Rural.	—	Nil.	—	—	—	—	—	—
	Stokelsey, Rural	—	Nil.	—	—	—	—	—	—
	Middlesbrough, Urban.	Oct. 19	49, Lord Street, N.W.	H. B.	M.	28	1	—	Stockton and Middlesbrough Water Board
		" 20	29, Portman Street, W.	W. T. D.	M.	4	1	—	" "
		" 20	17, Ruby Street, W.	M. F.	F.	30	1	—	" "
		" 20	22, Park Street, W.	B. W.	F.	12	1	—	" "
		" 20	14, Sutherland Street, S.	T. M.	M.	25	1	—	" "
		" 20	11, Ernest Street, S.	A. H.	M.	12	1	—	" "
		" 20	73, Hutchinson Street, N.W.	L. W.	F.	6	1	—	" "
		" 20	44, Rockliffe Street, N.W.	E. H.	F.	10	1	—	" "
		" 20	36, Bolekow Street, W.	T. P.	M.	4	1	—	" "
		" 20	45, Hatherley Street, N.W.	A. J.	F.	26	1	—	" "
		" 21	103, Calthorpe Street, N.W.	J. R.	M.	22	1	—	" "
		" 21	16, Marshall Street, S.	I. H.	F.	17	1	—	" "
		" 21	10, Robert Street, W.	T. P.	M.	31	1	—	" "
		" 21	4, Whin Street, W.	E. F.	F.	18	1	—	" "
		" 22	59, Spencer Street, N.W.	M. C.	F.	13	1	—	" "
		" 22	9, Woodhouse Terrace, N.W.	W. A.	M.	4	1	—	" "
		" 22	83, Monkland Street, W.	T. O.	M.	21	1	—	" "
		" 23	15, Fallow Street, M.	H. B.	M.	45	1	—	" "
		" 24	44, Union Street, S.	W. H.	M.	38	1	—	" "
		" 24	45, Alexandria Street, N.W.	M. S.	F.	38	—	1	" "
		" 24	10, Alexandria Street, N.W.	S. A. B.	F.	18	1	—	" "
		" 24	26, Dock Street, N.E.	H. B.	M.	48	1	—	" "
		" 24	27, Fallows Street, M.	M. S.	F.	52	1	—	" "
		" 24	13, Atlas Street, N.E.	W. G.	M.	11	1	—	" "
		" 24	15, Balder Street, N.E.	M. J. A.	F.	19	1	—	" "
		" 26	12, Beanfort Street, S.	E. W.	F.	50	1	—	" "
		" 27	161, Linthorpe Road, W.	A. L.	F.	25	1	—	" "
		" 27	29, Newton Street, M.	T. F.	M.	40	1	—	" "
		" 27	19, Mineral Street, N.E.	C. E. G.	M.	14	—	1	" "
		" 27	9, Cross Street, N.E.	M. D.	F.	14	1	—	" "
		" 27	12, Sutherland Street, S.	A. W.	M.	28	1	—	" "

Notified during Fortnight ending	Sanitary District.	Date of Notification.	Address.	Initials of Patient.	Sex.	Age.	Primary.	Secondary.	Water Supply obtained from
1.	2.	2.	4.	5.	6.	7.	8.	9.	10.
1890. Nov. 1 —cont.	Middlesbrough, Urban—cont.	1890. Oct. 27	4, Princes Road, W. -	P. D.	M.	15	1	—	Stockton and Middlesbrough Water Board.
		" 27	58, Lincoln Street, N.W.	D.	F.	70	—	1	" "
		" 27	69, Calthorpe Street, N.W.	W. H.	M.	25	1	—	" "
		" 28	7, Acklam Terrace, S. -	A. W.	M.	28	1	—	" "
		" 29	135, Duncombe Street, N.W.	E. R.	F.	14	—	1	" "
		" 29	8, Raby Street, N.W. -	I. T.	M.	7	1	—	" "
		" 30	22, Granville Street, N.W.	T. B.	M.	22	1	—	" "
		" 30	45, Disraeli Street, N.W.	R. W.	M.	8	1	—	" "
		" 30	9, Garnett Street, W. -	G.E.H.S.	M.	24	1	—	" "
		" 30	35, Lawson Street, N.W.	M. E. W.	F.	10	1	—	" "
		" 30	55, Richmond Street, W.	S. S.	F.	36	1	—	" "
		" 31	27, Bank Street, N.W. -	E. U.	M.	18	—	1	" "
		" 31	91, North Ormesby Road, N.E.	J. M.	M.	23	1	—	" "
		Nov. 1	47, Rock Street, N.E. -	M. P.	F.	49	1	—	" "
		" 1	97, Albert Road, M. -	L. T.	F.	21	1	—	" "
		" 1	28, Elm Street, M. -	L. A.	F.	3	1	—	" "
		" 1	16, Francis Street, N.W.	D. A.	M.	9	1	—	" "
		" 1	11, Lincoln Street, N.W.	M. R.	M.	21	1	—	" "
	South Stockton, Urban.	Oct. 20	13, New Street - -	J. A. D.	F.	26	1	—	" "
		" 20	14, Hannah Street -	A. P.	F.	15	1	—	" "
		" 21	22, Queen Street - -	T. N.	M.	7	1	—	" "
		" 23	22, Leonard Street -	J. M.	M.	50	1	—	" "
		" 24	32, Britannia Street -	T. C.	M.	14	1	—	" "
		" 24	74, Queen Street - -	J. W. B.	M.	16	1	—	" "
		" 25	32, Glasgow Street -	M. I. H.	F.	25	1	—	" "
		" 29	Leybourne Terrace, West-bury Street.	F. L.	M.	17	1	—	" "
		" 30	23, Georgiana Street -	D. M.	F.	5	—	1	" "
		" 30	11, Elizabeth Street -	J. M.	M.	46	1	—	" "
		" 31	35, Thornaby Road - -	H. W.	F.	24	1	—	" "
		" 31	21, Cuthbert Street -	E. W.	M.	17	1	—	" "
		Nov. 1	2, Denmark Street -	J. T. S.	M.	17	1	—	" "
	Ormesby, Urban	Oct. 20	30, Hymer Street - -	P. McG.	M.	21	1	—	" "
		" 20	2, Short Street - -	C. M.	M.	12	1	—	" "
		" 22	18, Telford Street -	G. N. N.	M.	31	1	—	" "
		" 25	65, Stovin Street - -	E. S.	F.	23	1	—	" "
	Normanby, Urban.	Nov. 1	8, Wellington Street, S.B.	S. A. W.	F.	35	1	—	" "
		" 1	51, Graham Street, S.B. -	H. C.	M.	29	1	—	" "
		" 1	43, West Terrace, S.B. -	B. M.	F.	12	1	—	" "
	Eston, Urban -	Oct. 21	17, Bessemer Street, Grangetown.	J. P.	M.	40	1	—	" "
		" 22	2, Stapylton Street, Grangetown.	J. M.	M.	10	1	—	" "
		" 23	108, Laing Street, Grange-town.	M. A. H.	F.	6	1	—	" "
		" 24	5, Bessemer Street, Grangetown.	J. McK.	M.	5	1	—	" "
		" 24	20, Bottomley's Row, Eston.	S. A. W.	F.	24	1	—	" "
		" 31	13, Stead's Buildings, Eston.	M. P.	F.	29	1	—	" "
		Nov. 1	Cleveland House, South Bank.	B. D.	F.	22	1	—	" "
	Middlesbrough, Rural.	—	Nil.	—	—	—	—	—	—
	Kirkleatham, Urban.	—	Nil.	—	—	—	—	—	—
	Redear, Urban -	—	Nil.	—	—	—	—	—	—
	Guisbrough, Urban.	—	Nil.	—	—	—	—	—	—
	Skelton and Brotton, Urban.	—	Nil.	—	—	—	—	—	—
	Saltburn-by-the-Sea, Urban.	—	Nil.	—	—	—	—	—	—
	Loftus, Urban -	—	Nil.	—	—	—	—	—	—
	Guisbrough, Rural.	—	Nil.	—	—	—	—	—	—

Notified during Fortnight ending	Sanitary District.	Date of Notification.	Address.	Initials of Patient.	Sex.	Age.	Primary.	Secondary.	Water Supply obtained from
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1890. Nov. 1— cont.	Richmond, Urban.	1890. —	Nil.	—	—	—	—	—	—
	Richmond, Rural.	—	Nil.	—	—	—	—	—	—
Nov. 15	Teesdale, Rural	—	Nil.	—	—	—	—	—	—
	Barnard Castle, Urban.	—	Nil.	—	—	—	—	—	—
	Auckland, Rural	—	Nil.	—	—	—	—	—	—
	Bishop Auckland, Urban.	—	Nil.	—	—	—	—	—	—
	Shildon, Urban	—	Nil.	—	—	—	—	—	—
	Spennymoor, Urban.	—	Nil.	—	—	—	—	—	—
	Darlington, Urban.	Nov. 5	82, Park Street, S. - -	A. W.	F.	12	1	—	Darlington Corporation Waterworks.
		" 5	King William Street, E. -	W. K.	M.	1	1	—	" "
		" 7	6, St. John's Crescent, E.	L. H.	F.	17	1	—	" "
		" 14	24, Wycombe Street, W.	P. P.	M.	14	1	—	" "
		" 14	24, Wycombe Street, W.	L. P.	F.	11	—	1	" "
		" 14	24, Wycombe Street, W.	L. P.	F.	5	—	1	" "
	Darlington, Rural	—	Nil	—	—	—	—	—	—
	Stockton-on-Tees, Urban.	Nov. 2	38, Wren Street, W.E. -	A. H.	M.	5	1	—	Stockton and Middlesbrough Water Board.
		" 3	10, Kingston Street, T. -	J. L. Y.	M.	8	1	—	" "
		" 3	8, Alberto Street, N.W. -	E. S.	F.	12	1	—	" "
		" 4	High Street, S.E. -	F. C.	M.	29	1	—	" "
		" 5	31, Thompson Street, N.W.	C. M.	M.	6	1	—	" "
		" 6	7, James Street, S.E. -	E. S.	F.	18	1	—	" "
		" 10	28, Tees Street, V. - -	J. D.	M.	7	1	—	" "
		" 10	12, Howard Street, T. -	J. G.	M.	32	1	—	" "
		" 10	33, Major Street, V. -	I. C.	M.	24	1	—	" "
		" 10	32, Headlam Street, T. -	T. S.	M.	27	1	—	" "
		" 10	32, St. Ann's Road, Po. -	P. E.	M.	19	1	—	" "
		" 11	Back Henzell Street, N.W.	F. A.	M.	5	1	—	" "
		" 11	Turk's Head, Norton Road, N.W.	A. R.	M.	21	1	—	" "
		" 13	3, Selwyn Street, Pa. -	J. C.	F.	5	1	—	" "
		" 13	20, Rupert Street, Po. -	J. R. W.	M.	48	—	1	" "
		" 14	27, Byron Street, N.W. -	M. E. M.	F.	3½	—	1	" "
	Stockton, Rural	" 4	19, Elm Street, Haverton Hill.	E. P.	F.	8	1	—	" "
		" 4	19, Elm Street, Haverton Hill.	J. H.	M.	10	—	1	" "
		" 7	19, Elm Street, Haverton Hill.	E. P.	F.	31	—	1	" "
	Sedgefield, Rural	—	Nil.	—	—	—	—	—	—
	Hartlepool, Urban.	Nov. 7	Priplek Street - -	K.	M.	20	1	—	Hartlepool Water Co.
		" 14	2, Olive Street - -	L.	F.	26	1	—	" "
	West Hartlepool, Urban.	" 3	Cumberland Street - -	J. S.	F.	29	1	—	" "
		" 15	Reed Street - - -	A. H.	M.	9	1	—	" "
	Hartlepool, Rural.	—	Nil.	—	—	—	—	—	—
	Northallerton, Urban.	—	Nil.	—	—	—	—	—	—
	Northallerton, Rural.	—	Nil.	—	—	—	—	—	—
	Stokesley, Rural	Nov. 3	Hutton - - -	*C.W.S.	M.	34	1	—	Stockton and Middlesbrough Water Board.

* Contracted disease in Middlesbrough.

Notified during Fortnight ending	Sanitary District.	Date of Notification.	Address.	Initials of Patient.	Sex.	Age.	Primary.	Secondary.	Water Supply obtained from
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1890. Nov. 15— cont.	Middlesbrough, Urban.	1890. Nov. 2	Imeson's Terrace, M. -	A. A.	F.	13	1	—	Stockton and Middlesbrough Water Board.
		" 2	100, Monkland Street, W. -	I. L.	F.	23	1	—	
		" 2	64, Spencer Street, N.W. -	H. D.	M.	7	—	1	
		" 3	34 Rockcliffe Street, N.W. -	E. B. B.	F.	20	1	—	
		" 3	59, Denmark Street, N.W. -	T. C.	M.	30	1	—	
		" 3	51, Millbank Street, N.W. -	J. W. A.	M.	6	—	1	
		" 3	54, Millbank Street, N.W. -	J. T. L.	M.	16	—	1	
		" 4	9, Hoppers Yard, N.E. -	W. B.	M.	18	1	—	
		" 5	49, Millbank Street, N.W. -	T. H. P.	M.	5	1	—	
		" 5	7, Hopkins Street, N.W. -	J. L.	M.	19	1	—	
		" 5	47, Severn Street, N.E. -	H. G.	M.	15	1	—	
		" 6	3, Cardwell Street, N.W. -	S. A. G.	F.	8	1	—	
		" 6	38, Rockcliffe Street, N.W. -	T. M.	M.	5	1	—	
		" 7	15, Elliott Street, M. -	A. C.	M.	22	1	—	
		" 7	8, Linthorpe Mews, M. -	M. B.	M.	21	1	—	
		" 7	16, Frances Street, N.E. -	J. R.	M.	6	—	1	
		" 7	32, Alexandria Street, N.W. -	E. A. H.	F.	7	1	—	
		" 8	1, Taylor Street, W. -	D. A.	M.	22	1	—	
		" 8	7, William Street, W. -	M. K.	F.	4	1	—	
		" 8	75, Denmark Street, N.W. -	R. E.	F.	10	—	1	
		" 8	82, Milton Street, S. -	T. M.	M.	31	1	—	
		" 8	14, Black Street, S. -	W. G.	M.	14	1	—	
		" 10	19, Lowe Street, N.W. -	M. B.	M.	35	—	1	
		" 10	18, Fidler Street, N.E. -	T. P.	M.	18	1	—	
		" 10	21, Lowe Street, N.W. -	W. C.	M.	20	1	—	
		" 10	58, Lincoln Street, N.W. -	L. A. H.	F.	15	—	1	
		" 10	38, Bolckow Street, W. -	B. B.	F.	12	1	—	
		" 10	71, Arthur Street, N.W. -	S.	F.	24	—	1	
		" 10	Gladstone Hotel, Stockton Street, N.W. -	H. B. H.	F.	16	1	—	
		" 10	34, Dale Street, W. -	W. B.	M.	10	—	1	
		" 11	11, Charles Street, N.E. -	W. B.	M.	19	1	—	
		" 11	30, Carlton Street, S. -	J. P.	M.	60	1	—	
		" 11	22, Garritt Street, S. -	C. H.	M.	22	—	1	
		" 12	41, Argyle Street, N.W. -	S. A. F.	F.	21	1	—	
		" 12	5, Birk Street, W. -	E. F.	F.	23	1	—	
		" 12	100, Lumley Street, M. -	T. F. G.	M.	3	1	—	
		" 14	170, Cannon Street, N.W. -	S. T.	M.	17	1	—	
		" 15	108, Marton Road, N.E. -	C. C.	M.	50	1	—	
		" 15	14, Cross Street, N.E. -	I. W. D.	M.	5	1	—	
		" 15	39, Rock Street, N.E. -	G. M.	M.	27	1	—	
	South Stockton, Urban.	" 4	13, Reed Street -	R. B.	M.	40	1	—	
		" 4	5, North Street -	A. B.	F.	14	1	—	
		" 5	28, Britannia Street -	I. M.	F.	15	1	—	
		" 10	36, Glasgow Street -	T. S.	M.	18	1	—	
		" 14	8, Eldon Street -	I. D. A.	M.	16	1	—	
	Ormesby, Urban	" 7	42, Bargate Street -	E. B.	F.	3½	—	1	
		" 6	78, Pierson Street -	C. A.	M.	11	1	—	
	Normanby, Urban.	" 4	22, Clarendon Street -	P. M.	M.	22	1	—	
		" 10	24, Coral Street -	M. C.	F.	10	1	—	
		" 12	57, Princes Street -	A. M.	F.	9	1	—	
		" 14	63, North Street -	J. M.	M.	13	1	—	
	Eston, Urban	" 5	16, Bolckow Terrace, Grangetown.	M. J. E.	F.	17	1	—	
		" 11	117, Stapylton Street, Grangetown.	F. D.	M.	27	1	—	
		" 11	17, Eston Grange, Grange-town.	J. C.	M.	12	1	—	
		" 13	89, Stapylton Street, Grangetown.	M. McC.	M.	46	1	—	
	Middlesbrough, Rural.	—	Nil.	—	—	—	—	—	
	Kirkleatham, Urban.	Nov. 12	Ivor House, Coatham -	G. I.	F.	20	1	—	Stockton and Middlesbrough Water Board.
	Redear, Urban -	—	Nil.	—	—	—	—	—	
	Guisbrough, Urban.	—	Nil.	—	—	—	—	—	
	Skelton and Brotton, Urban	—	Nil.	—	—	—	—	—	
	Saltburn-by-the- Sea, Urban.	—	Nil.	—	—	—	—	—	

Notified during Fortnight ending.	Sanitary District.	Date of Notification.	Address.	Initials of Patient.	Sex.	Age.	Primary.	Secondary.	Water Supply obtained from
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1890. Nov. 15 —cont.	Loftus, Urban -	1890. —	Nil.	—	—	—	—	—	—
	Guisbrough, Rural.	—	Nil.	—	—	—	—	—	—
	Richmond, Urban	—	Nil.	—	—	—	—	—	—
Nov. 29	Richmond, Rural	Nov. 3	Eppeby* - - -	W.C.	M.	35	1	—	Well.
		" 6	North Cowton - - -	D. A. D.	F.	14	—	1	"
	Teesdale, Rural	—	Nil.	—	—	—	—	—	—
	Barnard Castle, Urban.	—	Nil.	—	—	—	—	—	—
	Auckland, Rural	Nov. 29	Woodlands - - -	J. S.	M.	7	1	—	Well.
	Bishop Auckland, Urban.	—	Nil.	—	—	—	—	—	—
	Shildon, Urban -	Nov. 16	10, Albert Street - - -	J. S.	M.	9	1	—	Weardale and Shildon Water Co.
	Spennymoor, Urban.	—	Nil.	—	—	—	—	—	—
	Darlington, Urban	Nov. 19	28, Backhouse Street, S. -	W. J. B.	M.	20	1	—	Darlington Corporation Waterworks.
		" 17	24, Wycombe Street, W. -	M. P.	F.	14	—	1	" "
		" 18	2, Sun Street, N.W. -	S. G.	F.	32	1	—	" "
		" 22	2, Sun Street, N.W. -	D. G.	F.	7	—	1	" "
		" 27	17, King Street, N.W. -	H. N.	M.	12	1	—	" "
		" 21	22, Edmund Street, N. -	J. W. H.	M.	13	1	—	" "
	Darlington, Rural	" 21	Cockerton - - -	A. E. S.	M.	11	—	1	" "
		" 21	Cockerton - - -	R. S.	F.	47	—	1	" "
		" 25	Girsby - - -	I. W. C.	M.	18	1	—	Well.
		" 28	Cockerton - - -	H. S.	M.	1	—	1	Darlington Corporation Waterworks.
		" 29	Heighington - - -	S. G.	F.	15	1	—	Well.
	Stockton-on-Tees, Urban.	" 17	1, Bright Street, E. -	J. A. B.	M.	42	1	—	Stockton and Middlesbrough Water Board.
		" 17	8, Alexander Street, W.E. -	R. F.	M.	20	1	—	" "
		" 17	20, Brunswick Street, E. -	F. U.	F.	4	1	—	" "
		" 17	24, Herbert Street, V. -	E. K.	F.	17	1	—	" "
		" 18	3, Hind's Court, E. -	C. C.	F.	16	1	—	" "
		" 18	44, Sheraton Street, W.E. -	E. D.	F.	17	—	1	" "
		" 19	Workhouse, Po. - -	F. H.	M.	7	—	1	" "
		" 21	29, William Street, E. -	F. T.	F.	5	—	1	" "
		" 22	3, Selwyn Street, Pa -	J. C.	M.	6	—	1	" "
		" 22	90, Headlam Street, T. -	H. E.	M.	6	1	—	" "
		" 22	22 ¹ / ₂ , Skinner Street, E. -	W. B.	M.	3	1	—	" "
		" 22	22 ¹ / ₂ , Skinner Street, E. -	P. B.	F.	4	—	1	" "
		" 25	90, Albion Street, E. -	H. H.	F.	23	1	—	" "
		" 26	8, Bright Street, E. -	C. A.	F.	5	1	—	" "
		" 27	5, Craister Street, T. -	E. B.	F.	8	1	—	" "
		" 27	9, Church Row, V. -	M. C.	F.	15	1	—	" "
		" 27	8, Bright Street, E. -	W. J. A.	M.	3	—	1	" "
Nov. 29	Stockton, Rural	" 22	10, Ash Street, Haverton Hill.	P. B.	M.	3	1	—	" "
		" 22	10, Oak Street, Haverton Hill.	G. G.	M.	3	1	—	" "
		" 18	Clarence Street, Haverton Hill.	I. G.	M.	13	—	1	" "
Nov. 29	Sedgefield, Rural	—	Nil.	—	—	—	—	—	—
	Hartlepool, Urban	Nov. 29	2, Olive Street - - -	G. L.	M.	3	—	1	Hartlepool Water Co.
	West Hartlepool, Urban.	" 19	Andrew Street - - -	M. J.	F.	21	1	—	" "
Nov. 29		" 27	Avenue Road - - -	F. L.	F.	14	1	—	" "
	Hartlepool, Rural	—	Nil.	—	—	—	—	—	—
Nov. 29	Northallerton, Urban.	—	Nil.	—	—	—	—	—	—

* In Darlington two or three times during the fortnight prior to illness.

Notified during Fortnight ending	Sanitary District.	Date of Notification.	Address.	Initials of Patient.	Sex.	Age.	Primary.	Secondary.	Water Supply obtained from
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1890. Nov. 29 —cont.	Northallerton, Rural.	1890. —	Nil.	—	—	—	—	—	—
	Stokesley, Rural	—	Nil.	—	—	—	—	—	—
	Middlesbrough, Urban.	Nov. 16	64, Spencer Street, N.E. -	P. D.	M.	35	—	1	Stockton and Middlesbrough Water Board.
		" 17	52, Queen Mary Street, N.E.	L. B.	F.	9	1	—	
		" 18	10, Smith Street, W. -	M. W.	F.	19	1	—	
		" 18	14, Bottomley Street, M. -	M. H.	F.	8	1	—	
		" 20	9, Woodhouse Terrace, N.W.	J. A.	M.	10	1	—	
		" 20	42, France Street, N.E. -	J. W.	M.	6	1	—	
		" 20	7, Short Street, M. -	M. J.	F.	2	—	1	
		" 20	1, France Street, N.E. -	I. C.	M.	5	1	—	
		" 20	20, Lower East Street, N.E.	A. B.	F.	8	1	—	
		" 20	87, Spencer Street, N.W.	J. H. K.	M.	10	1	—	
		" 20	64, Spencer Street, N.W.	M. D.	F.	4	—	1	
		" 20	Lower Commercial Street, N.E.	E. F.	F.	49	1	—	
		" 22	17, Farrer Street, N.W. -	L. F.	F.	15	—	1	
		" 22	17, Farrer Street, N.W. -	H. F.	M.	9	1	—	
		" 24	46, Milton Street, S. -	H. L.	M.	11	1	—	
		" 24	37, Granville Street, N.W.	M. B.	F.	30	1	—	
		" 24	10, Alexandria Street, N.W.	E. B.	F.	15	1	—	
		" 24	35, Bank Street, N.W. -	A. D.	F.	30	1	—	
		" 24	3, Harris Street, W. -	L. W.	F.	21	1	—	
		" 27	63, Church Street, S. -	T. P.	M.	45	1	—	
		" 27	114, Duncombe Street, N.W.	M. A. C.	F.	5	1	—	
		" 27	86, Monkland Street, W.	A. G.	M.	28	1	—	
		" 28	87, Calthorpe Street, N.W.	M. Q.	F.	14	1	—	
		" 28	53, Marsh Road, N.W. -	M. H.	F.	5	1	—	
		" 29	41, Argyle Street, N.W. -	J. T. F.	M.	11	—	1	
		" 29	51, Lime Street, N.W. -	J. R.	M.	23	1	—	
	South Stockton, Urban.	" 21	31, James Street -	M. A. W.	F.	32	1	—	"
		" 24	20, George Street -	L. F.	F.	5	1	—	
		" 25	14, Wellington Street -	J. B.	M.	20	1	—	
	Ormesby, Urban	" 20	Cottage Hospital -	K. D.	F.	16	1	—	"
	Normanby, Urban	" 27	15, West Terrace -	H. P.	F.	18	1	—	"
	Eston, Urban -	" 18	17, Eston Grange -	J. W.	M.	28	—	1	"
		" 21	5, Vaughan Street, Grange town.	M. C.	F.	44	1	—	
	Middlesbrough, Rural.	—	Nil.	—	—	—	—	—	—
	Kirkleatham, Urban.	—	Nil.	—	—	—	—	—	—
	Redcar, Urban -	—	Nil.	—	—	—	—	—	—
	Guisbrough, Urban.	—	Nil.	—	—	—	—	—	—
	Skelton and Brotton, Urban.	—	Nil.	—	—	—	—	—	—
	Saltburn-by-the- Sea, Urban.	—	Nil.	—	—	—	—	—	—
	Loftus, Urban -	—	Nil.	—	—	—	—	—	—
	Guisbrough, Rural.	—	Nil.	—	—	—	—	—	—
	Richmond, Urban	—	Nil.	—	—	—	—	—	—
	Richmond, Rural	—	Nil.	—	—	—	—	—	—
Dec. 13	Teesdale, Rural	—	Nil.	—	—	—	—	—	—

Notified during Fortnight ending	Sanitary District.	Date of Notification.	Address.	Initials of Patient.	Sex.	Age.	Primary.	Secondary.	Water Supply obtained from
1	2.	3.	4.	5.	6.	7.	8.	9.	10.
1890. Dec. 13 -cont.	Barnard Castle, Urban.	1890. —	Nil	—	—	—	—	—	—
	Auckland, Rural	—	Nil.	—	—	—	—	—	—
	Bishop Auckland, Urban.	Nov. 30	Blue Row - - -	E. H.	F.	7	1	—	Bishop Auckland Waterworks.
		" 30	Great Gates - - -	M.	?	?	1	—	" "
		Dec. 5	Wood Street - - -	R.	M.	10	1	—	" "
	Shildon, Urban -	—	Nil.	—	—	—	—	—	—
	Spennymoor, Urban.	—	Nil.	—	—	—	—	—	—
	Darlington, Urban.	Dec. 11	32, Coburg Street, C. -	F. A. L.	F.	8	1	—	Darlington Corporation Waterworks.
		" 1	2, Silver Street, E. -	A. J. H.	F.	18	1	—	" "
		" 1	13, Adelaide Street, E. -	M. W.	F.	21	1	—	" "
	Darlington, Rural	" 8	Cockerton - - -	I. S.	F.	19	—	1	" "
	Stockton-on-Tees, Urban.	" 1	3, Webster Street, W.E. -	G. J. W.	M.	8	1	—	Stockton and Middlesbrough Water Board.
		" 1	3, Lawson Street, W.E. -	S. P.	F.	3	1	—	" "
		" 1	75, Webster Street, W.E. -	W. C.	M.	24	1	—	" "
		" 2	1, Spring Street, S.W. -	H. H.	M.	9	1	—	" "
		" 4	3, Vine Street, Pa. -	E. J.	F.	9	—	1	" "
		" 5	48, Suffolk Street, W.E. -	R. B.	M.	26	1	—	" "
		" 8	3, Elm Street, V. -	E. J.	F.	5	—	1	" "
		" 8	20, Brunswick Street, E. -	T. U.	M.	32	1	—	" "
		" 9	7, Hill Street West, V. -	T. W.	M.	50	1	—	" "
		" 9	9, Wyndham Street, Po. -	M. B.	F.	12	1	—	" "
		" 9	24, Hartington Road, W.E. -	M. E. R.	F.	5	1	—	" "
	Stockton, Rural	" 2	18, Ash Street, Haverton Hill.	P. C.	M.	36	1	—	" "
		" 2	18, Ash Street, Haverton Hill.	M. C.	F.	30	—	1	" "
		" 3	8, Ash Street, Haverton Hill.	T. W. L.	M.	4	1	—	" "
		" 10	9, Slag Row, Stillington -	J. F.	M.	17	1	—	Carlton Ironworks (mixed with Stockton and Middlesbrough Water).
		" 10	6, Cottage Street, Haverton Hill.	A. B.	F.	11	1	—	Stockton and Middlesbrough Water Board.
		" 10	19, Oak Street, Haverton Hill.	M. A.	F.	50	—	1	" "
		" 10	21, Elm Street, Haverton Hill.	J. B.	M.	9	1	—	" "
		" 10	64, Port Clarence - - -	J. D.	M.	32	1	—	" "
		" 10	Norton - - -	K.	F.	37	1	—	" "
	Sedgefield, Rural	—	Nil.	—	—	—	—	—	—
	Hartlepool, Urban.	Dec. 12	3, Warren Terrace -	K.	M.	9	1	—	Hartlepool Water Co.
	West Hartlepool, Urban.	" 9	Bridge Street - - -	G. L.	M.	27	1	—	" "
		" 9	Villiers Street - - -	E. B.	F.	11	1	—	" "
		" 12	Derwent Street - - -	M. A.	F.	21	1	—	" "
	Hartlepool, Rural	—	Nil.	—	—	—	—	—	—
	Northallerton, Urban.	—	Nil.	—	—	—	—	—	—
	Northallerton, Rural.	—	Nil.	—	—	—	—	—	—
	Stokesley, Rural	—	Nil.	—	—	—	—	—	—
	Middlesbrough, Urban.	Dec. 1	8, Mount Street, M. -	R. S.	M.	22	1	—	Stockton and Middlesbrough Water Board.
		" 1	9, Spencer Street, N.W. -	E. A. J.	F.	9	1	—	" "
		" 2	15, Spencer Street, N.W. -	A. J. C.	F.	27	1	—	" "
		" 4	62, Denmark Street, N.W. -	T. H.	M.	30	1	—	" "
		" 6	9, William Street, W. -	A. C.	M.	4	—	1	" "
		" 8	1, Fraunce Street, N.E. -	J. A. C.	F.	7	—	1	" "
		" 8	2, Peacocks Yard, N.E. -	W. McM.	M.	8	1	—	" "

Notified during Fortnight ending	Sanitary District.	Date of Notification.	Address.	Initials of Patient	Sex.	Age.	Primary.	Secondary.	Water Supply obtained from
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1890. Dec. 13	Middlesbrough, Urban— <i>cont.</i>	1890. Dec. 9	11, Lime Street, N.W. -	E. T.	M.	20	—	1	Stockton and Middlesbrough Water Board.
		" 10	Harris Cottage, Cargo Fleet Road, N.E.	J. B.	M.	16	1	—	" "
		" 12	68, Farrer Street, N.W. -	E. W.	F.	50	1	—	" "
		" 12	Municipal Buildings, M.	N. K.	F.	9	1	—	" "
		" 12	39, Kendal Street, N.W.	J. R.	M.	9	1	—	" "
		" 12	14, Hanson Street, N.W.	J. E.	M.	16	1	—	" "
		" 12	10, Albion Place, N.E. -	L. S.	F.	6	1	—	" "
		" 12	11, Lincoln Street, N.W.	T. S.	F.	30	—	1	" "
		" 13	54, Corporation Road, M.	G. H.	M.	18	1	—	" "
		" 13	14, Welford Street, N.W.	M. A.	F.	32	1	—	" "
	South Stockton, Urban.	—	Nil.	—	—	—	—	—	—
	Ormesby, Urban	Dec. 3	84, Hymer Street - -	J. G.	F.	21	1	—	Stockton and Middlesbrough Water Board.
		" 8	4, James Street - -	C. H.	M.	20	1	—	" "
		" 9	29, Charles Street - -	M. A.	F.	30	1	—	" "
	Normanby, Urban	—	Nil.	—	—	—	—	—	—
	Eston, Urban -	—	Nil.	—	—	—	—	—	—
	Middlesbrough, Rural.	—	Nil.	—	—	—	—	—	—
	Kirkleatham, Urban.	—	Nil.	—	—	—	—	—	—
	Redcar, Urban -	—	Nil.	—	—	—	—	—	—
	Guisbrough, Urban.	—	Nil.	—	—	—	—	—	—
	Skelton and Brotton, Urban.	—	Nil.	—	—	—	—	—	—
	Saltburn-by-the-Sea, Urban.	—	Nil.	—	—	—	—	—	—
	Loftus, Urban -	—	Nil.	—	—	—	—	—	—
	Guisbrough, Rural.	—	Nil.	—	—	—	—	—	—
	Richmond, Urban	—	Nil.	—	—	—	—	—	—
	Richmoud, Rural	—	Nil.	—	—	—	—	—	—
Dec. 27	Teesdale, Rural	—	Nil.	—	—	—	—	—	—
	Barnard Castle, Urban.	—	Nil.	—	—	—	—	—	—
	Auckland, Rural	—	Nil.	—	—	—	—	—	—
	Bishop Auckland, Urban.	—	Bishop Auckland - -	J. D. W.	M.	6	1	—	Bishop Auckland Waterworks.
		—	Gray Street, Bishop Auckland.	G. B.	F.	5	1	—	" "
	Shildon, Urban -	Dec. 4	Auckland Terrace - -	F. T.	M.	65	1	—	Weardale and Shildon Water Co.
		" 4	10, Albert Street - -	J. E. W.	F.	33	—	1	" "
	Spennymoor, Urban.	—	Nil.	—	—	—	—	—	—
	Darlington, Urban.	Dec. 22	30, Farrer Street, C. -	J. A. H.	F.	12	1	—	Darlington Corporation Waterworks
		" 23	6, Dixon Terrace, C. -	S. A. S.	F.	8	1	—	" "
		" 24	19, Laurence Street, E. -	E. T.	F.	10	1	—	" "
		" 22	9, Primrose Street, W. -	J. M.	M.	9	1	—	" "
		" 24	11, Larchfield Street, W.	C. M.	F.	5	1	—	" "

Notified during Fortnight ending	Sanitary District.	Date of Notification.	Address.	Initials of Patient.	Sex.	Age.	Primary.	Secondary.	Water Supply obtained from
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1890. Dec. 27— cont.	Darlington, Rural	1890. Dec. 23	Middleton St. George -	R. S.	M.	22	1	—	Stockton and Middles- brough Water Board.
	Stockton - on - Tees, Urban.	" 15	57, Bickersteth Street, Pa.	J. E.	M.	33	1	—	" "
		" 15	73, Pearson Street, Pa. -	T. U.	M.	15	1	—	" "
		" 16	57, Ewbank Street, W.E.	D. E.	M.	31	1	—	" "
		" 18	11, Cromwell Street, V. -	A. S.	M.	25	1	—	" "
		" 18	20, Mario Street, N.W. -	M. E. T.	F.	45	1	—	" "
		" 20	28, Mary Street, W.E. -	T. S.	M.	9	1	—	" "
		" 23	10, Francis Street, N.W.	T. B.	M.	25	1	—	" "
		" 23	22, Garden Place, S.E. -	C. B.	F.	12 $\frac{1}{2}$	1	—	" "
		" 26	46, Portrack Lane, V. -	J. M.	M.	23	1	—	" "
		" 26	Custom House Tavern, S.E.	A. K.	F.	22	1	—	" "
		" 27	2, Ellicott Street, Pa. -	R. C.	M.	25	—	1	" "
		" 27	Old Mill, Mill Lane, E. -	M. R.	F.	8	1	—	" "
		" 27	High Street, S.E. -	E. W.	F.	24	1	—	" "
		" 27	27, Byron Street, N.W. -	E. M.	F.	14	—	1	" "
		" 27	6, Balaclava Street, C. -	P. R.	F.	15	1	—	" "
	Stockton, Rural	" 14	9, Ash Street, Haverton Hill.	F.	?	27	1	—	" "
		" 18	18, Elm Street, Haverton Hill.	G. O.	M.	16	—	1	" "
		" 15	Billingham Lane -	C.	M.	65	1	—	Well.
		" 15	Billingham Lane -	K.	?	8	1	—	" "
		" 22	Billingham Lane -	K.	?	14	—	1	" "
		" 25	Norton -	J. C.	M.	?	—	1	Stockton and Middles- brough Water Board.
		" 25	Hartburn Terrace -	E. W.	F.	3	1	—	" "
		" 25	6, Temperance View, Haverton Hill.	J. S.	M.	16	1	—	" "
		" 18	6, Temperance View, Haverton Hill.	T. S.	M.	27	—	1	" "
		" 24	6, Church Street, Carlton	W. M.	M.	48	—	1	" "
		" 24	Yorkshire Road, Haverton Hill.	B. C.	F.	26	1	—	" "
		" 23	10, Ash Street, Haverton Hill.	J. H.	M.	31	—	1	" "
		" 24	Clarence Street, Haverton Hill	J. C.	M.	22	—	1	" "
		" 25	High Street, Norton -	M. F.	F.	38	1	—	" "
	Sedgefield, Rural	—	Nil.	—	—	—	—	—	—
	Hartlepool, Urban.	Dec. 15	13, Watson Street -	G.	M.	5	1	—	Hartlepool Water Co.
	West Hartlepool Urban.	" 16	Stainton Street - -	A. K.	F.	5	1	—	Well. "
		" 17	Ouston Street - -	A. L.	F.	21	1	—	" "
		" 25	Dean Street - -	P. H.	M.	9	1	—	Hartlepool Water Co.
		" 27	Middleton Road - -	M. M.	F.	18	1	—	" "
	Hartlepool, Rural	—	Nil.	—	—	—	—	—	—
	Northallerton, Urban.	—	Nil.	—	—	—	—	—	—
	Northallerton, Rural.	—	Nil.	—	—	—	—	—	—
	Stokesley, Rural	Dec. 16	Yarm-on-Tees - -	H. R.	M.	19	1	—	Stockton and Middles- brough Water Board.
	Middlesbrough, Urban	" 18	31, Bowley Street, S. -	J. F.	M.	18	—	1	" "
		" 18	7, Ryedale Terrace, M. -	J. W. B.	F.	34	1	—	" "
		" 18	11, France Street, N.E. -	M. E. C.	F.	11	1	—	" "
		" 18	37, Rutland Street, M. -	M. B.	F.	14	1	—	" "
		" 18	Newport Crescent, W. -	E. C.	F.	21	—	1	" "
		" 20	104, Marton Road, N.E. -	S. M. C.	F.	14	1	—	" "
		" 21	11, Turner Street, N.W. -	M. R.	F.	29	1	—	" "
		" 22	107, Russell Street, M. -	E. H.	F.	20	1	—	" "
		" 22	35, Benson Street, S. -	M. B.	F.	17	1	—	" "
		" 22	20, Gurney Street, M. -	S. W.	M.	27	1	—	" "
		" 22	112, Newport Road, S. -	S. L.	M.	17	1	—	" "
		" 22	9, Charles Street, N.E. -	E. C.	M.	10	1	—	" "
		" 24	26, Dundas Street, M. -	J. E. M.	M.	8	1	—	" "
		" 24	Elms Club, N.E. -	E. L.	F.	24	1	—	" "
		" 24	103, Calthorpe Street, N.W.	J. S.	M.	21	—	1	" "

Notified during Fortnight ending	Sanitary District.	Date of Notification.	Address.	Initials of Patient.	Sex.	Age.	Primary.	Secondary.	Water Supply obtained from
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1890. Dec. 27— cont.	Middlesbrough, Urban—cont.	1890. Dec. 26	21, Emily Street, M.	S. A. I.	F.	20	1	—	Stockton and Middlesbrough Water Board.
		" 26	Gosford Arms, Gosford Street, N.E.	G. W. C.	M.	8	1	—	
		" 26	Imeson's Terrace, S.	A. L.	M.	4	—	1	
		" 26	8, Oliver Street, S.	G. W.	M.	21	1	—	
		" 26	54, Marton Road, N.E.	M. S.	M.	23	1	—	
		" 26	27, Queen Mary Street, N.W.	W. W.	M.	15	1	—	
		" 26	34, Elm Street, M.	E. J. W.	F.	18	1	—	
		" 26	13, Wood Street, N.E.	L. F.	F.	13	1	—	
		" 26	22, Thorpe Street, N.W.	B. K.	M.	20	1	—	
		" 26	59, Church Street, S.	R. J.	M.	15	1	—	
		" 27	16, Alfred Street, W.	W. S.	M.	35	1	—	
		" 27	29, Beech Street, M.	J. C.	M.	34	1	—	
		" 27	11, Willow Street, M.	G. F.	M.	19	1	—	
		" 27	14, Laura Street, M.	R. A.	M.	24	1	—	
	South Stockton, Urban.	" 14	Mandale Road	F. B.	F.	13	1	—	
		" 16	Swarthmore Terrace	W. A.	M.	25	1	—	
		" 22	14, Wellington Street	D. S.	M.	7	—	1	
		" 22	81, Cobden Street	M. E. T.	F.	14	—	1	
		" 22	10, Hartington Street	D. L.	M.	12	1	—	
		" 22	13, Queen Street East	A. S.	M.	19	1	—	
		" 23	49, Thornaby Road	E. L.	M.	36	1	—	
		" 24	6, Cobden Street	S. L.	F.	31	1	—	
		" 25	92, Trafalgar Street	E. M.	F.	16	1	—	
		" 26	11, Francis Street	J. A. F.	F.	24	1	—	
	Ormesby, Urban	" 26	71, Thornaby Road	S. C.	M.	10	1	—	
		" 26	7, Queen Street, West	W. L.	M.	31	1	—	
		" 27	25, Market Place	L. M.	F.	16	1	—	
		" 27	25, Market Place	J. M.	M.	14	—	1	
	Normanby, Urban	" 27	41, Charles Street	A. T.	F.	22	1	—	
		" 27	34, Queen Street	J. G.	M.	14	1	—	
	Normanby, Urban	—	Nil.	—	—	—	—	—	—
	Eston, Urban	Dec. 18	Eston Grange	W. C.	M.	23	1	—	Stockton and Middlesbrough Water Board.
		" 18	74, Cheetham Street, Grange-town.	G. H.	M.	41	1	—	
		" 26	117, Bessemer Street, Grange-town.	R. A. T.	F.	19	1	—	
		" 26	20, Laing Street, Grange-town.	J. C.	M.	3	1	—	
		" 27	18, Whitworth Road, Grange-town.	A. A.	M.	16	1	—	
		" 27	98, Laing Street, Grange-town.	H. S.	M.	22	1	—	
	Middlesbrough, Rural.	—	Nil.	—	—	—	—	—	—
	Kirkleatham, Urban.	Dec. 20	Widgeon Street, Warrenby	K.	M.	28	1	—	Stockton and Middlesbrough Water Board.
		" 21	Bentinck Terrace, Coatham.	J. W.	M.	2½	1	—	
		" 23	3, Lobster Road, Coatham	B. B.	F.	2½	1	—	
	Redcar, Urban	" 19	7, Portland Terrace*	E. W. T.	M.	30	1	—	" "
	Guisbrough, Urban.	—	Nil.	—	—	—	—	—	—
	Skelton and Brotton, Urban.	—	Nil.	—	—	—	—	—	—
	Saltburn-by-the-Sea, Urban.	—	Nil.	—	—	—	—	—	—
	Loftus, Urban	—	Nil.	—	—	—	—	—	—
	Guisbrough, Rural.	—	Nil.	—	—	—	—	—	—
	Richmond, Urban	Dec. 24	The Barr†	J. T.	M.	20	1	—	Richmond Corporation Waterworks.
	Richmond, Rural	—	Nil.	—	—	—	—	—	

* Case imported from North Lackenby.

† Contracted the disease at Stockton-on-Tees.

Notified during Fortnight ending	Sanitary District.	Date of Notification.	Address.	Initials of Patient.	Sex.	Age.	Primary.	Secondary.	Water Supply obtained from
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1891. Jan. 10 —cont.	Stockton - on - Tees, Urban —cont.	1890. Dec. 31	Osborne House, W.E. -	D. G.	F.	11	1	—	Stockton and Middlesbrough Water Board.
		" 31	7, Neasham Street, V. -	T. C.	M.	9	—	1	" "
		" 31	28, Bath Street, V. -	E. M. E.	F.	14	1	—	" "
		" 31	32, Wren Street, W.E. -	J. Y.	M.	10½	1	—	" "
		" 31	1, Green Dragon Yard, S.E.	J. L.	M.	23	1	—	" "
		1891. Jan. 2	34, Alice Street, W.E. -	C. S.	M.	25	1	—	" "
		" 2	3, Norfolk Street, W.E. -	J. W. F.	M.	9	1	—	" "
		" 2	17, Castlegate, S.E. -	E. W.	F.	10½	1	—	" "
		" 2	High Street, C. -	P. B. B.	M.	25	1	—	" "
		" 2	Hartington, Road, W.E. -	J. W. H.	M.	24	1	—	" "
		" 3	8, Atkinson Street, C. -	M. E. B.	F.	2	1	—	" "
		" 3	23, Russell Street, C. -	J. B.	F.	17	1	—	" "
		" 3	34, Craister Street, T. -	R. H. H.	M.	4½	1	—	" "
		" 3	24, Wharf Street, S.E. -	A. W.	F.	14	1	—	" "
		" 3	10, Lawson Street, W.E. -	E. W.	M.	6	1	—	" "
		" 5	55, Chalk Street, Pa. -	S. E. C.	F.	10½	1	—	" "
		" 5	23, Arlington Street, Pa. -	A. W.	F.	16	1	—	" "
		" 5	10, Allison Street, C. -	J. E. D.	F.	17½	1	—	" "
		" 5	14, Langley Street, C. -	R. W. W.	M.	8	1	—	" "
		" 5	27, Byron Street, N.W. -	J. M.	F.	9	—	1	" "
		" 5	9, Varo Street, V. -	M. S.	F.	4	1	—	" "
		" 5	9, Varo Street, V. -	J. J. S.	M.	16	—	1	" "
		" 5	7, Neasham Street, V. -	W. C.	M.	9	—	1	" "
		" 5	11, Longley Street, Pa. -	M. J. W.	F.	15½	1	—	" "
		" 5	39, Webster Street, W.E. -	L. H.	F.	6	1	—	" "
		" 5	39, Webster Street, W.E. -	L. H.	F.	10	—	1	" "
		" 5	Wild Ox Hotel, T. -	E. H.	F.	20	1	—	" "
		" 5	11, Florence Street, V. -	W. B.	M.	7	1	—	" "
		" 5	6, Paradise Row, S.E. -	A. L.	F.	30	1	—	" "
		" 6	41, Elliott Street, Po. -	E. G.	F.	22	1	—	" "
		" 6	17, Barrett Street, Po. -	M. E. S.	F.	11	1	—	" "
		" 6	10, Hanlon Street, Po. -	R. C.	F.	22	1	—	" "
		" 6	17, Starkey Street, V. -	M. L.	F.	45	1	—	" "
		" 6	43, Mill Street, C. -	S. J. B.	F.	5½	1	—	" "
		" 6	12, Bowser Street, V. -	R. J.	M.	6	1	—	" "
		" 6	14, Hill Street West, Po. -	J. D.	M.	9	1	—	" "
		" 6	Northcote Street, S.W. -	W. R. K.	M.	16	1	—	" "
		" 6	10, Neasham Street, V. -	R. P.	M.	13	1	—	" "
		" 6	30, Howden Street, C. -	R. A. C.	M.	20	1	—	" "
		" 6	16, Webster Street, S.W. -	W. M.	M.	9	1	—	" "
		" 7	Light Pipe Hall Road, W.E.	G. J.	M.	11	1	—	" "
		" 7	14, Wren Street, W.E. -	M. D.	F.	9	1	—	" "
		" 7	68, Lawson Street, E. -	W. J. S.	M.	12	1	—	" "
		" 7	43, Skinner Street, E. -	N. E. C.	F.	40	1	—	" "
		" 7	20, Leeds Street, C. -	A. D.	F.	8	1	—	" "
		" 7	West Villas, W.E. -	S. A. D.	F.	58	1	—	" "
		" 7	15, Palmerston Street, E. -	A. J. B.	F.	8	—	1	" "
		" 7	13, Lawson Street, E. -	S. J. B.	F.	14	—	1	" "
		" 7	Allison Street, C. -	J. R. H.	M.	19	1	—	" "
		" 7	33, Emily Street, N.W. -	J. S.	M.	22	1	—	" "
		" 8	Tees Bridge Cottage, S.W. -	S. H.	F.	16	1	—	" "
		" 8	11, Housewife Lane, S.E. -	D. A. G.	F.	16	1	—	" "
		" 9	75, Parliament Street, Pa. -	J. M.	M.	15	1	—	" "
		" 9	20, Alice Street, W.E. -	T. S.	M.	7	1	—	" "
		" 9	6, Ware Street, T. -	E. D.	F.	19	1	—	" "
		" 9	21, Hanley Street, C. -	J. W.	M.	37	1	—	" "
		" 9	13, Atkinson Street, C. -	F. F.	M.	12	1	—	" "
		" 9	1, Howden Street, C. -	J. H.	M.	23	1	—	" "
		" 9	21, Cobden Street, C. -	S. H.	F.	40	1	—	" "
		" 10	55, Pearson Street, Pa. -	M. A. H.	F.	13	1	—	" "
		" 10	17, Garibaldi Street, N.W. -	W. D.	M.	15	1	—	" "
		" 10	3, Back John Street, C. -	J. G. N.	M.	26	1	—	" "
		" 10	28, Mary Street, W.E. -	P. S.	M.	3½	1	—	" "
		" 10	High Street, S.E. -	T	F.	27	1	—	" "
	Stockton, Rural	" 2	Clarence Street, Haverton -	G. P.	M.	34	1	—	" "
		" 2	Norton - - -	P.	F.	20	—	1	" "
		" 10	7, Ash Street, Haverton -	T. R.	M.	22	1	—	" "
		" 2	Green, Billingham -	S. D.	F.	36	1	—	Well.
		" 9	110, Port Clarence -	I. H.	M.	19	1	—	Stockton and Middlesbrough Water Board.
		" 1	Yorkshire Row, Haverton -	E.	F.	50	1	—	" "
		" 5	Eaglescliffe -	J. H.	M.	5	1	—	" "
		" 1	Eaglescliffe Junction -	M. D.	F.	12	1	—	" "
	Sedgefield, Rural	--	Nil.	—	—	—	—	—	—
	Hartlepool, Urban.	Jan. 10	116, Northgate - -	A.	M.	12	1	—	Hartlepool Water Co.

Notified during Fortnight ending	Sanitary District.	Date of Notification.	Address.	Initials of Patient.	Sex.	Age.	Primary.	Secondary.	Water Supply obtained from
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1891. Jan. 10— cont.	West Hartlepool, Urban.	1890. Dec. 28	Ward's Terrace -	E. M.	F.	26	1	—	Hartlepool Water Co. Well.
		" 29	Alice Street -	T. McC.	M.	6	1	—	
		1891. Jan. 9	Ada Street -	E. B.	F.	8	1	—	
	Hartlepool, Rural	—	Nil.	—	—	—	—	—	—
	Northallerton, Urban.	—	Nil.	—	—	—	—	—	—
	Northallerton, Rural.	—	Nil.	—	—	—	—	—	—
	Stokesley, Rural	1891. Jan. 4	Whorlton* -	S. J. K.	F.	20	1	—	Stockton and Middlesbrough Water Board
		" 5	Yarm -	A. A.	M.	12	1	—	
	Middlesbrough, Urban.	1890. Dec. 29	7, Grange Road East, M.	H. B.	M.	23	1	—	" "
		" 29	24, Randolph Street, N.W.	M. D.	M.	37	1	—	" "
		" 29	50, Jamieson Street, N.W.	J. S.	F.	7	1	—	" "
		" 29	87, Spencer Street, N.W.	A. F.	F.	28	—	1	" "
		" 29	8, Bright Street, M.	J. R. H.	M.	8	—	1	" "
		" 30	34, Bridge Street, West, W.	J. A. M.	F.	7	1	—	" "
		" 30	36, Bolckow Street, W.	J. P.	M.	14	—	1	" "
		" 30	14, Lune Street, N.E.	M. M.	F.	7	1	—	" "
		" 30	14, Clyde Street N.E.	R. C.	M.	26	1	—	" "
		" 30	33, Pelham Street, W.	M. G.	F.	6	1	—	" "
		" 30	35, Park Street, W.	E. L.	M.	8	1	—	" "
		" 30	11, Salisbury Street, N.W.	A. T.	F.	8	1	—	" "
		" 30	50, Denmark Street, N.W.	J. T.	F.	18	1	—	" "
		" 31	17, Vaughan Street, W.	F. S.	M.	16	1	—	" "
		" 31	60, Westward Street, W.	W. M.	M.	28	1	—	" "
		" 31	21, Bottomley Street, M.	W. J. F.	M.	10	1	—	" "
		" 31	5, Hopper's Yard, N.E.	J. O. D.	M.	27	1	—	" "
		" 31	60, Bolckow Street, W.	H. D.	M.	10	1	—	" "
		" 31	48, Bridge Street, West, W.	R. H. H.	M.	20	1	—	" "
		" 31	2, St. Paul's Road, S.	T. T.	M.	5	1	—	" "
		" 31	Villas, M.	C. E.	M.	10	1	—	" "
		" 31	40, Colne Street, N.E.	E. N.	M.	19	1	—	" "
		" 31	5, Leeman Terrace, Linthorpe Road, S.W.	W. S.	M.	13	1	—	" "
		" 31	Lower Commercial Street, N.E.	A. F.	M.	8	—	1	" "
		" 31	14, Marsh Road, N.W.	E. A. L.	F.	17	1	—	" "
		" 31	Old Linthorpe, S.	L. B.	F.	17	1	—	" "
		" 31	117, Corporation Road, M.	B. M.	F.	11	1	—	" "
		" 31	9, Spencer Street, N.W.	D. C.	F.	19	1	—	" "
		" 31	90, Spencer Street, N.W.	M. M.	F.	45	1	—	" "
		1891. Jan. 1	32, Lamport Street, S.	E. S.	M.	24	1	—	" "
		" 1	124, Newport Road, S.	H. R.	M.	34	1	—	" "
		" 1	18, North Ormesby Road, N.E.	M. J. B.	F.	42	1	—	" "
		" 1	18, North Ormesby Road, N.E.	J. B.	M.	18	1	—	" "
		" 1	1, Marl Street, N.E.	W. W.	M.	32	1	—	" "
		" 1	18, Crown Street, W.	T. S.	M.	13	1	—	" "
		" 1	60, Stockton Street, N.W.	G. H. D.	M.	4	1	—	" "
		" 1	72, School Croft, N.E.	J. W. T.	M.	10	1	—	" "
		" 1	19, Queen's Terrace, M.	N. E.	F.	14	1	—	" "
		" 1	5, Mount Street, M.	E. M.	F.	15	1	—	" "
		" 2	12, Samuelson Street, N.W.	A. B.	F.	14	1	—	" "
		" 2	7, Linthorpe Mews, M.	E. L.	F.	20	1	—	" "
		" 2	4, Olive Street, W.	M. H.	F.	12	1	—	" "
		" 2	35, Hill Street, W.	A. C.	M.	10	1	—	" "
		" 2	11, Cragg Street, N.E.	G. K.	M.	27	1	—	" "
		" 2	8, Randolph Street, N.W.	E. A. C.	F.	9	1	—	" "
		" 2	1, Woodlands Terrace, M.	C. B.	M.	7	1	—	" "
		" 2	28, Pembroke, Street, M.	E. H.	F.	14	1	—	" "
		" 2	126, Newport Road, S.	S. P.	F.	13	1	—	" "
		" 2	14, Watson Street, M.	I. S.	F.	2	1	—	" "
		" 2	4, Ruby Street, S.	J. G.	M.	28	1	—	" "
		" 2	2, Union Street, S.	J. T. R.	M.	28	1	—	" "
		" 2	34, Avon Street, N.E.	G. C.	M.	18	1	—	" "
		" 2	1, Robinson's Yard, N.E.	H. O. N.	M.	11	1	—	" "
		" 2	7, Lumley Street, S.	E. W.	F.	4	1	—	" "
		" 2	Linthorpe Avenue, S.	A. E. B.	M.	11	1	—	" "
		" 2	5, Buck Street, N.W.	J. H.	M.	10	1	—	" "
		" 3	2, Hutchinson Street, N.W.	J. T. A.	M.	8	1	—	" "
		" 3	132, Marsh Road, N.W.	J. D.	M.	6	1	—	" "
		" 3	29, St. Paul's Road, S.	J. A. F.	F.	9	1	—	" "
		" 3	Derwent Villa, S.	I. B.	F.	20	1	—	" "
		" 3	5, Albert Place, M.	G. W. J.	M.	16	1	—	" "

* Contracted disease at Stockton-on-Tees.

Notified during Fortnight ending	Sanitary District.	Date of Notification.	Address.	Initials of Patient.	Sex.	Age.	Primary.	Secondary.	Water Supply obtained from
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1891. Jan. 10— cont.	Middlesbrough, Urban—cont.	1891. Jan. 3	50, Lower Feversham Street, N.E.	F. C.	M.	13	1	—	Stockton and Middlesbrough Water Board.
		" 3	Ineson's Terrace, S.	M. K.	M.	13	1	—	" "
		" 5	111, Barritt Street, S.	R. C. B.	M.	10	1	—	" "
		" 5	46, Lumley Street, S.	F. M.	F.	4	1	—	" "
		" 5	Coal Depôt, Charles Street, N. E.	J. W.	M.	29	1	—	" "
		" 5	40, Corporation Road, M.	L. R.	F.	8	1	—	" "
		" 5	73, Hutchinson Street, N.W.	G. C.	M.	11	—	1	" "
		" 5	38, Harris Street, W.	F. H.	F.	15	1	—	" "
		" 5	2, John Street, W.	F. H.	M.	15	1	—	" "
		" 5	22, Lincoln Street, N.W.	M. J.	M.	45	1	—	" "
		" 5	1, Lloyd Street, N.W.	M. J. C.	F.	5	1	—	" "
		" 5	16, Croft Street, N.W.	M. S.	F.	14	1	—	" "
		" 5	18, Walker Street, N.W.	D. McC.	M.	3	1	—	" "
		" 5	9, Whitehouse Street, S.	E. M. S.	F.	7	1	—	" "
		" 5	8, Pollard Street, M.	S. R.	F.	20	1	—	" "
		" 5	97, Grange Road, West, W.	R. I.	M.	15	1	—	" "
		" 5	97, Grange Road, West, W.	K. I.	F.	17	—	1	" "
		" 5	97, Grange Road, West, W.	J. I.	M.	13	—	1	" "
		" 5	97, Grange Road, West, W.	A. I.	M.	6	—	1	" "
		" 5	5, Denmark Street, N.W.	E. M. B.	F.	37	1	—	" "
		" 5	134, Marsh Road, N.W.	T. S.	F.	20	1	—	" "
		" 5	3, Grange Terrace, S.	D. D.	M.	38	1	—	" "
		" 5	Swatters Carr Hotel, S.	R. R.	M.	35	1	—	" "
		" 5	20, Borough Road, W.	M. J. C.	F.	16	1	—	" "
		" 5	104, Grange Road, West, W.	L. B.	F.	19	1	—	" "
		" 5	104, Grange Road, West, W.	L. B.	F.	10	—	1	" "
		" 6	13, Milbank Street, N.W.	R. A. M.	F.	12	1	—	" "
		" 6	10, Spring Street, N.E.	D. T.	M.	14	1	—	" "
		" 6	Southfield Grove, S.	E. D.	M.	39	1	—	" "
		" 6	90, Hill Terrace, S.	F. W. H.	M.	16	1	—	" "
		" 6	36, Hill Street, W.	J. C.	F.	13	1	—	" "
		" 6	107, Linthorpe Road, W.	D. J.	M.	2½	1	—	" "
		" 6	27, Durham Street, N.E.	P. R.	M.	22	1	—	" "
		" 6	83, Wilson, Street, W.	E. T. R. R.	F.	9	1	—	" "
		" 6	22, Woodhouse Terrace, N.W.	F. B.	M.	24	1	—	" "
		" 7	24, France Street, N.E.	T. K.	M.	11	1	—	" "
		" 7	56, Cargo Fleet Road, N.E.	W. S.	M.	16	1	—	" "
		" 7	12, Brunswick Street, M.	J. B.	M.	12	1	—	" "
		" 7	33, Ash Street, M.	S. N.	M.	37	1	—	" "
		" 7	9, William Street, W.	W. C.	M.	16	—	1	" "
		" 7	Newton, Street, M.	I. H.	F.	77	1	—	" "
		" 7	3, Cargo Fleet Road, N.E.	E. M.	F.	14	1	—	" "
		" 7	126, Grange Road, East, M.	E. McK.	F.	20	1	—	" "
		" 7	54, Buxton Street, M.	F. C.	M.	21	1	—	" "
		" 7	8, Hazel Street, M.	H. T.	M.	24	1	—	" "
		" 7	21, Teare Street S.	F. P.	F.	14	1	—	" "
		" 7	10, Lampont Street, S.	S. T.	M.	18	—	1	" "
		" 7	36, Alexandria Street, N.W.	W. H. C.	M.	17	1	—	" "
		" 7	4, Auckland Place, N.E.	M. A. J.	F.	7	1	—	" "
		" 8	26, Lower Gosford Street, N.E.	J. O. D.	M.	15	1	—	" "
		" 8	Blue Hall, Linthorpe, S.	F. E. E.	F.	16	1	—	" "
		" 8	28, Farrer Street, N.W.	G. S.	M.	23	1	—	" "
		" 8	20, Dunning Street, M.	H. L.	M.	10	1	—	" "
		" 9	28, Robinson Street, N.W.	C. W. H.	M.	9	1	—	" "
		" 9	59, Harris Street, N.W.	A. H.	F.	12	1	—	" "
		" 10	14, Bowley Street, S.	T. R.	M.	24	1	—	" "
		" 10	52, Queen Mary Street, N.W.	J. W. B.	M.	8	—	1	" "
		" 10	1, Monsell Street, N.W.	P. G.	F.	18	1	—	" "
		" 10	11, Shakespcare Street, M.	W. H.	M.	30	1	—	" "
		" 10	17, Lees Street, S.	A. S.	F.	18	1	—	" "
	South Stockton, Urban.	1890. Dec. 29	7, Mandale Road	B. W.	F.	16	1	—	" "
		" 29	10, Butterwick Place	M. S.	F.	4	1	—	" "
		" 30	22, Hibernia Street	J. C.	M.	14	1	—	" "
		" 31	23, Gilmour Street	C. C.	M.	16	1	—	" "
		1891. Jan. 2	25, Mandale Road	C. G. H.	M.	27	1	—	" "
		" 2	71, Thornaby Road	A. C.	M.	7	—	1	" "
		" 2	4, Eldon Street	G. S.	M.	18	1	—	" "
		" 2	8, Harewood Street	J. W. T.	M.	31	1	—	" "
		" 2	38, Trafalgar Street	G. W.	M.	29	1	—	" "
		" 3	41, Francis Street	A. T.	F.	10	1	—	" "
		" 3	52, Gladstone Street	B. M.	F.	40	1	—	" "
		" 4	4, Caledonia Street	S. R.	F.	16	1	—	" "
		" 5	5, Derby Street	W. A.	M.	22	1	—	" "
		" 5	96, Trafalgar Street	J. E. B.	F.	16	1	—	" "
		" 5	74, Trafalgar Street	M. D.	F.	39	1	—	" "
		" 5	8, Hall Street	J. L.	M.	19	1	—	" "

Notified during Fortnight ending	Sanitary District.	Date of Notification.	Address.	Initials of Patient.	Sex.	Age.	Primary.	Secondary.	Water Supply obtained from
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1891. Jan. 10— cont.	South Stockton, Urban—cont.	1891. Jan. 6	27, Stafford Place	- A. B.	F.	8	1	—	Stockton and Middlesbrough Water Board.
		" 7	5, Queen Street, West	- E. I.	M.	17	1	—	" "
		" 8	7, Long Row	- P. H.	M.	24	1	—	" "
		" 9	40, George Street	- J. C. A.	M.	16	1	—	" "
		" 9	17, Edward Street	- M. C.	F.	19	1	—	" "
		" 9	23, Cuthbert Street	- J. R. P.	M.	8	1	—	" "
		" 9	19, Derby Street	- G. T.	M.	14	1	—	" "
		" 9	31, Chelmsford Street	- M. H.	F.	18	—	1	" "
		" 10	25, Skinner Street	- W. B.	M.	38	1	—	" "
	Ormesby, Urban	1890. Dec. 31	30, King's Road	- M. H.	F.	13	1	—	" "
		" 31	30, King's Road	- A. M. H.	F.	10	—	1	" "
		" 31	21, Pierson Street	- M. H. P.	F.	13	1	—	" "
		1891. Jan. 2	32, King's Road	- A. B.	M.	27	1	—	" "
		" 3	50, Tees Street	- K. W.	F.	17	1	—	" "
		" 3	5, Pennyman Street	- C. D.	M.	10	1	—	" "
		" 6	34, Pennyman Street	- J. W. A.	M.	12	1	—	" "
		" 7	12, Harrison Street	- A. W.	M.	11	1	—	" "
		" 7	11, Pierson Street	- E. I. I.	F.	12	1	—	" "
	Normanby, Urban	" 2	63, Queen Street	- M. C.	F.	19	1	—	" "
		" 2	27, Branch Street	- T. R.	M.	9	1	—	" "
		" 2	26, Jackson Street	- L. L.	F.	12	1	—	" "
		" 2	42, Princes Street	- S.	F.	28	1	—	" "
		" 2	8, Graham Street	- H. L.	F.	20	1	—	" "
		" 2	16, Connaught Street	- J. W.	M.	33	1	—	" "
		" 2	73, West Terrace	- W. W.	M.	23	1	—	" "
		" 6	3, Station Terrace	- M. L.	F.	12	1	—	" "
		" 6	34, Princes Street	- ?	?	32	1	—	" "
		" 6	15, Diamond Street	- I. R.	M.	12	1	—	" "
		" 6	52, Upper Jackson Street	- T. A.	M.	8	1	—	" "
		" 6	79, Queen Street	- I. B.	F.	19	1	—	" "
		" 6	29, Jackson Street	- J. P.	M.	11	1	—	" "
		" 6	60, Nelson Street	- L.	F.	23	1	—	" "
		" 6	168, North Street	- I. I.	M.	26	1	—	" "
	Eston, Urban	" 5	12, Stead's Buildings, Eston.	- F. C.	M.	16	1	—	" "
		" 5	Keeper's House, Grange-town.	- J. H.	M.	40	—	1	" "
		" 5	90, Laing Street, Grange-town.	- J. H.	M.	11	1	—	" "
		" 5	70, Stapylton Street, Grange-town.	- T. B.	M.	16	1	—	" "
		" 5	120, Laing Street, Grange-town.	- J. W.	M.	16	1	—	" "
		" 6	102, Vickers Street, Grange-town.	- J. W. J.	M.	10	1	—	" "
		" 6	72, Laing Street, Grange-town.	- J. A.	F.	8	1	—	" "
		" 6	31, Munby Street, South Bank.	- B. G.	M.	32	1	—	" "
		" 9	25, Wood Street, Grange-town.	- F. K.	M.	6	1	—	" "
		" 9	98, Laing Street, Grange-town.	- J. L.	M.	22	—	1	" "
		" 10	21, Vickers Street, Grange-town.	- G. W.	M.	6	1	—	" "
	Middlesbrough, Rural.	—	Nil.	—	—	—	—	—	—
	Kirkleatham, Urban.	1890. Dec. 29	26, Old Coatham	- G. G.	F.	14	1	—	Stockton and Middlesbrough Water Board
		1891. Jan. 2	13, Pierson Street, Coatham	- L. A.	F.	11	1	—	" "
		" 5	Belmont Terrace, Coatham	- C. I.	F.	31	1	—	" "
		" 9	Victory Terrace, Coatham	- M. S.	M.	11	1	—	" "
	Redear, Urban	—	Nil.	—	—	—	—	—	—
	Guisbrough, Urban.	—	Nil.	—	—	—	—	—	—
	Skelton and Brotton, Urban.	Jan. 2	53, Gladstone Street, Brotton.*	- G. R.	M.	50	1	—	Stockton and Middlesbrough Water Board.
		" 9	2, New Brotton	- L. I.	M.	58	1	—	" "
	Saltburn-by-the-Sea, Urban.	—	Nil.	—	—	—	—	—	—
	Loftus, Urban	—	Nil.	—	—	—	—	—	—
	Guisbrough, Rural.	—	Nil.	—	—	—	—	—	—
	Richmond, Urban	—	Nil.	—	—	—	—	—	—

* Imported case.

Notified during Fortnight ending	Sanitary District.	Date of Notification.	Address.	Initials of Patient.	Sex.	Age.	Primary.	Secondary.	Water Supply obtained from
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1891. Jan. 10— <i>cont</i>	Richmond, Rural	1891. —	Nil.	—	—	—	—	—	—
Jan. 24	Teesdale, Rural	Jan. 24	Red House, near Whorlton	S.	F.	33	1	—	Well.
	Barnard Castle, Urban.	—	• Nil.	—	—	—	—	—	—
	Auckland, Rural	Jan. 11	Blackhall, Harperby	H. H.	F.	57	1	—	?
	Bishop Auckland, Urban.	—	Nil.	—	—	—	—	—	—
	Shildon, Urban	—	Nil.	—	—	—	—	—	—
	Spennymoor, Urban.	Jan. 19	30 Arthur Street	R. G. R.	M.	?	1	—	Waskerley Water Co.
	Darlington, Urban.	„ 12	11, Chesnut Street, C.	M. I. M.	F.	22	1	—	Darlington Corporation Waterworks.
		„ 13	Bridge Row, C.	A. R. W.	M.	17	1	—	„ „
		„ 13	Crown Street, C.	J. T.	M.	7	1	—	„ „
		„ 13	46, Brunswick Street, C.	M. J. W.	F.	22	1	—	„ „
		„ 16	23, Russell Street, C.	A. E.	F.	16	1	—	„ „
		„ 15	5, Luck's Terrace, S.	T. W. S.	M.	17	1	—	„ „
		„ 12	9, Wesley Street, E.	H. W.	F.	24	1	—	„ „
		„ 12	4, Dickinson, Street, E.	E. J.	M.	9	1	—	„ „
		„ 15	24, Wycombe Street, W.	J. P.	M.	7	—	1	„ „
		„ 19	25, East Raby Street, W.	W. C.	M.	42	1	—	„ „
		„ 14	3, Thompson Street West, N.	W. F.	M.	15	1	—	„ „
		„ 17	21, Whessoc Lane, N.	H. M.	M.	15	4	—	„ „
	Darlington, Rural.	„ 12	Blackwell	T.	F.	30	—	1	„ „
		„ 14	Middleton St. George	K. D.	F.	13	1	—	Stockton and Middlesbrough Water Board
		„ 16	Middleton St. George	J. D.	M.	22	—	1	„ „
		„ 17	Over Dinsdale	C. W.	F.	24	1	—	Darlington Corporation Waterworks.
		„ 17	Blackwell	J. T.	M.	28	—	1	„ „
		„ 24	Middleton St. George	F. B.	M.	55	1	—	Stockton and Middlesbrough Water Board.
	Stockton - on - Tees, Urban.	„ 11	24, Thompson Street, N.W.	B. J. B.	M.	48	1	—	„ „
		„ 11	15, Fenny Street, N.W.	G. M.	M.	22	1	—	„ „
		„ 12	Turk's Head Inn, N.W.	T. T.	F.	21	—	1	„ „
		„ 12	Dovecot Street, E.	H. M.	F.	19	1	—	„ „
		„ 13	4, Regent Street, E.	E. J. H.	F.	21	1	—	„ „
		„ 13	1, Oxford Terrace, N.W.	G. S.	F.	26	1	—	„ „
		„ 13	26, Spring Street, S.W.	G. G.	M.	51	1	—	„ „
		„ 14	1, Stafford Street, Pa.	E. B.	F.	5	1	—	„ „
		„ 14	29, Cromwell Street, V.	J. G. H.	M.	15	1	—	„ „
		„ 14	64, Lawson Street, W.E.	L. S.	F.	6	1	—	„ „
		„ 14	31, Windsor Road, S.W.	B. W.	M.	5	1	—	„ „
		„ 14	22, Brown's Row, Po.	W. C.	M.	33½	1	—	„ „
		„ 15	20, Suffolk Street, W.E.	J. F.	F.	5	1	—	„ „
		„ 15	31, Windsor Road, S.W.	S. W.	F.	7	—	1	„ „
		„ 15	7 Wade Street, V.	S. B.	F.	56	1	—	„ „
		„ 15	12, Donald Street, N.W.	G. L.	M.	9	1	—	„ „
		„ 15	Fire Station, E.	J. D.	F.	7	1	—	„ „
		„ 15	Donald Street, N.W.	L. L.	F.	12	1	—	„ „
		„ 15	2, Union Street, E., Po.	M. L. B.	F.	10	1	—	„ „
		„ 15	25, Leonard Street, Po.	R. B.	M.	30	1	—	„ „
		„ 15	7, Ellicott Street, Pa.	R. R.	M.	37	1	—	„ „
		„ 16	29, Cecil Street, Pa.	S. J. H.	F.	18	1	—	„ „
		„ 16	13, Tynedale Street, W.E.	J. D.	M.	38	1	—	„ „
		„ 16	15, Herbert Street, V.	R. S.	M.	3	1	—	„ „
		„ 17	14, Florence Street, V.	J. A. S.	F.	21	1	—	„ „
		„ 17	14, Florence Street, V.	E. S.	M.	6	—	1	„ „
		„ 17	7, Neasham Street, V.	J. C.	M.	3	—	1	„ „
		„ 17	11, Routledge Street, T.	E. B.	F.	2	1	—	„ „
		„ 17	11, Routledge Street, T.	J. B.	M.	5	—	1	„ „
		„ 17	55, Tilery Road, T.	C. B.	M.	30	1	—	„ „
		„ 17	19, Allison Street, C.	R. W.	M.	22	1	—	„ „
		„ 17	Yarm Road, S.W.	F. W.	F.	5	1	—	„ „
		„ 17	17, Bowser Street, V.	H. L. C.	M.	40	1	—	„ „
		„ 19	41, Craister Street, T.	C. J. H.	M.	8	1	—	„ „
		„ 19	32, Mary Street, W.E.	E. T.	M.	21	1	—	„ „

Notified during Fortnight ending	Sanitary District.	Date of Notification.	Address.	Initials of Patient.	Sex.	Age.	Primary.	Secondary.	Water Supply obtained from
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1891. Jan. 24 —cont	Stockton - on Tees, Urban— cont.	1891. Jan. 19	4, Mill Street, C. -	J. G.	M.	23	1	—	Stockton and Middlesbrough Water Board.
		" 19	12, Moss Street, T. -	J. W.	M.	17	1	—	" "
		" 19	4, Barrington Crescent, S.W.	W. N.	M.	16	1	—	" "
		" 19	Bridge Road, S.E. -	W. L. W.	M.	54	1	—	" "
		" 20	Haswell Street, T. -	F. H. D.	M.	13	1	—	" "
		" 20	Haswell Street, T. -	M. D.	F.	3	—	1	" "
		" 20	Haswell Street, T. -	R. D.	M.	5	—	1	" "
		" 20	4, Brunswick, Street, E. -	M. H.	F.	10	1	—	" "
		" 21	32, Herbert Street, V. -	R. P.	M.	6	1	—	" "
		" 21	23, Headlam Street, T. -	H. C.	M.	26	1	—	" "
		" 22	8, Victoria Street, C. -	J. W. F.	M.	6	—	1	" "
		" 23	31, Windsor Road, S.W. -	E. W.	M.	8½	1	—	" "
		" 23	5, Varo Street, V. -	J. M.	M.	6	1	—	" "
		" 23	33, Adam Street, S.W. -	T. J.	M.	30	1	—	" "
		" 23	28, Cromwell Street, V. -	I. M.	F.	5	1	—	" "
	Stockton, Rural	" 13	Clarence Street, Haverton	M. H.	M.	17	1	—	" "
		" 13	Clarence Street, Haverton	R.	M.	28	1	—	" "
		" 13	Clarence Street, Haverton	R.	F.	15	—	1	" "
		" 13	Clarence Street, Haverton	B.	F.	50	1	—	" "
		" 13	Junction -	S.	F.	12	1	—	Well.
		" 13	45, Oak Street, Haverton	C.	M.	30	—	1	Stockton and Middlesbrough Water Board.
		" 13	18, Elm Street, Haverton	H.	M.	30	—	1	" "
		" 21	2, Old Station, Yarm -	F. D.	M.	5	1	—	" "
		" 21	27, Oak Street, Haverton	A. M.	F.	24	—	1	" "
	Sedgefield, Rural	—	Nil.	—	—	—	—	—	—
	Hartlepool, Urban.	Jan. 18	116, Northgate - -	A.	F.	13	—	1	Hartlepool Water Co.
		" 18	116, Northgate - -	A.	F.	6	—	1	" "
	West Hartlepool, Urban.	" 11	Warden Street - -	A. S.	F.	10	1	—	" "
		" 12	Northumberland St. -	M. P.	F.	24	1	—	" "
	Hartlepool, Rural.	—	Nil.	—	—	—	—	—	—
	Northallerton, Urban.	—	Nil.	—	—	—	—	—	—
	Northallerton, Rural.	—	Nil.	—	—	—	—	—	—
	Stokesley, Rural	—	Nil.	—	—	—	—	—	—
	Middlesbrough, Urban.	Jan. 11	26, Peel Street, S. -	W. E. H.	M.	5	1	—	Stockton and Middlesbrough Water Board.
		" 12	2, Welford Street, N.W. -	E. H.	F.	18	1	—	" "
		" 12	31, Bowley Street, S. -	M. A. W.	F.	12	—	1	" "
		" 12	31, Bowley Street, S. -	C. W.	F.	4	—	1	" "
		" 12	3, France Street, N.E. -	R. M.	M.	14	1	—	" "
		" 12	51, Disraeli Street, N.W. -	A. R.	M.	16	1	—	" "
		" 12	5, Buck Street, N.W. -	J. O.	M.	12	—	1	" "
		" 12	26, Bolckow Street, W. -	E. McE.	F.	9	1	—	" "
		" 12	31, Wye Street, N.E. -	C. W.	M.	12	1	—	" "
		" 12	7, Ryedale Terrace, M. -	P. T. B.	F.	6	1	—	" "
		" 13	15, St. John's Terrace, N.E.	W. W.	M.	20	1	—	" "
		" 13	35, Mount Street, M. -	A. S. B.	F.	21	1	—	" "
		" 13	31, Mount Street, M. -	J. W. B.	M.	18	1	—	" "
		" 13	Villas, M. -	H.	F.	12	1	—	" "
		" 13	22, Gauntlet, Street, N.W. -	G. W.	M.	19	1	—	" "
		" 13	50, Gladstone Street, N.W. -	H. A.	M.	14	—	1	" "
		" 13	49, Carter Street, N.W. -	A. D.	M.	7	1	—	" "
		" 13	111, Calthorpe Street, N.W. -	M. J. S.	F.	6	1	—	" "
		" 13	15, Pembroke Street, M. -	H. C.	M.	30	1	—	" "
		" 13	47, Vaughan Street, W. -	W. G.	M.	7	1	—	" "
		" 13	16, Marl Street, N.E. -	L. B.	F.	7	1	—	" "
		" 14	11, Queen's Terrace, M. -	B. S.	F.	6	1	—	" "
		" 14	8, Bright Street, M. -	G. H.	F.	3	—	1	" "
		" 14	23, Beech Street, M. -	E. L.	F.	13	1	—	" "
		" 15	23, Gladstone Street, N.W. -	W. F.	M.	7	1	—	" "
		" 15	5, Turner Street, N.W. -	W. J. M.	M.	4	1	—	" "
		" 15	92, Corporation Road, M. -	W. T.	M.	15	1	—	" "
		" 15	25, Jamieson Street, N.W. -	C. L.	F.	10	1	—	" "
		" 15	36, Alexan Iria Street, N.W.	A. C.	F.	15	—	1	" "
		" 15	Grove Hill, S. - -	W. R.	M.	9	1	—	" "
		" 15	Workhouse, S. -	P. H.	M.	4	—	1	" "

Notified during Fortnight ending	Sanitary District.	Date of Notification.	Address.	Initials of Patient	Sex.	Age.	Primary.	Secondary.	Water Supply obtained from
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1891. Jan. 24 —cont.	Middlesbrough, Urban—cont.	1891. Jan. 15	10, Benson Street, S. -	E. A. R.	F.	29	1	—	Stockton and Middlesbrough Water Board.
		" 15	63, Barritt Street, M. -	E. E. B.	M.	15	1	—	" "
		" 16	13, Elm Street, M. -	R. H. W.	M.	13	1	—	" "
		" 16	Ivy Cottage, Linthorpe, S. -	L. A. B.	F.	20	1	—	" "
		" 16	74, Johnson Street, W. -	J. H. C.	M.	4	1	—	" "
		" 16	9, Lawson Street, N.W. -	A. F.	M.	18	1	—	" "
		" 16	5, Bargate Street, N.W. -	J. H.	M.	16	1	—	" "
		" 16	73, Ernest Street, S. -	J. F. W.	F.	12	1	—	" "
		" 17	32, Emerald Street, S. -	H. B.	M.	19	1	—	" "
		" 17	17, Linthorpe Mews, M. -	W. J.	M.	4	1	—	" "
		" 19	42, Portman Street, S. -	A. A. S.	F.	12	1	—	" "
		" 19	91, Newport Road, N.W. -	H. S.	F.	5	1	—	" "
		" 19	27, Calvert Street, N.W. -	G. E.	M.	35	1	—	" "
		" 19	23, Welford Street, N.W. -	W. P.	M.	4	1	—	" "
		" 20	21, Tyne Street, N.E. -	E. H.	F.	31	1	—	" "
		" 20	120, Spencer Street, N.W. -	J. L.	M.	2	1	—	" "
		" 20	15, Lincoln Street, N.W. -	A. K.	F.	34	1	—	" "
		" 20	34, Dock Street, N.E. -	J. L.	M.	3	1	—	" "
		" 20	30, Avon Street, N.E. -	A. McS.	M.	17	1	—	" "
		" 20	4, Pelham Street, S. -	J. W.	M.	36	1	—	" "
		" 20	21, Bottomley Street, M. -	A. M. F.	F.	12	—	1	" "
		" 20	29, Station Street, W. -	H. S.	F.	13	1	—	" "
		" 20	12, Harrison Street, N.W. -	H. L.	M.	4	1	—	" "
		" 21	9, Pine Street, M. -	I. M.	F.	6	1	—	" "
		" 21	16, School Croft, N.E. -	F. W.	M.	3	1	—	" "
		" 21	79, North Ormesby Road, N.E. -	E. W.	F.	11	1	—	" "
		" 21	2, Barritt Street, M. -	N. L.	F.	14	1	—	" "
		" 21	27, Station Street, W. -	E. H.	F.	7	1	—	" "
		" 22	38, Bargate Street, N.W. -	M. E. C.	F.	8	1	—	" "
		" 22	13, Elm Street, M. -	J. W.	M.	9	1	—	" "
		" 22	27, Lime Street, N.W. -	E. D.	F.	10	1	—	" "
		" 23	27, Lincoln Street, N.W. -	P. T.	F.	16	1	—	" "
		" 23	19, Cross Street, N.E. -	L. H.	F.	14	1	—	" "
		" 23	8, Randolph Street, N.W. -	B. C.	F.	8	—	1	" "
		" 23	14, Marsh Road, N.W. -	A. L.	F.	16	—	1	" "
		" 23	14, Marsh Road, N.W. -	M. L.	F.	14	—	1	" "
		" 23	13, Marsh Street, N.W. -	G. M.	M.	30	1	—	" "
		" 23	89, Church Street, S. -	S. B.	M.	21	1	—	" "
		" 24	8, Albion Place, N.E. -	E. C.	F.	16	1	—	" "
		" 24	Chatham Villa, S. -	A. P.	F.	20	1	—	" "
		" 24	24, Peacock Street, M. -	W. W.	M.	18	1	—	" "
		" 24	5, Kent Street, M. -	M. K.	F.	35	1	—	" "
		" 24	The Willows, Linthorpe, S. -	E. B.	M.	12	1	—	" "
	South Stockton, Urban.	" 12	5, Queen Street West -	E. J.	M.	47	—	1	" "
		" 12	10, Leonard Street -	H. M.	F.	35	1	—	" "
		" 13	4, Cuthbert Street -	T. B.	M.	25	1	—	" "
		" 13	19, Stanley Grove -	J. D.	M.	5	1	—	" "
		" 14	15, Pioneer Street, Erimus -	W. E. T.	M.	8	1	—	" "
		" 14	2, Harewood Street -	G. H.	M.	6	1	—	" "
		" 14	1, Derby Terrace -	C. W.	F.	18	1	—	" "
		" 15	22, Hartington Street -	J. A. D.	F.	14	1	—	" "
		" 16	12, Swarthmore Terrace -	H. T.	M.	16	1	—	" "
		" 16	3, Harewood Terrace -	M. McK.	F.	13	1	—	" "
		" 16	4, Brotherwick Place -	J. S.	F.	6	1	—	" "
		" 20	18, Francis Street -	M. P.	F.	15	1	—	" "
		" 20	1, John Street -	A. D.	M.	20	1	—	" "
		" 22	8, Sun Street -	J. C.	M.	22	1	—	" "
		" 22	14, Hannah Street -	W. P.	M.	14	—	1	" "
		" 23	8, Hartington Street -	S. C.	F.	11	1	—	" "
		" 24	4, Gladder's Cottages -	N. R.	M.	46	1	—	" "
	Ormesby, Urban	" 12	36, Telford Street -	P. N.	F.	14	1	—	" "
		" 12	36, Telford Street -	F. B.	F.	5	—	1	" "
		" 12	3, Short Street -	M. J. B.	F.	17	1	—	" "
		" 14	6, Telford Street -	S. L.	F.	13	1	—	" "
		" 20	65, Stovin Street -	E. S.	M.	25	—	1	" "
		" 21	46, Pierson Street -	F. C.	F.	12	1	—	" "
		" 22	8, Worsley Street -	I. J.	M.	41	1	—	" "
		" 22	67, Hampden Street -	E. H.	F.	11	1	—	" "
	Normanby, Urban	—	Nil.	—	—	—	—	—	—
	Eston, Urban -	Jan. 13	129, Bessemer Street -	M. J. McC	F.	11	1	—	Stockton and Middlesbrough Water Board.
		" 24	Eston Junction -	R. A.	M.	34	1	—	" "
	Middlesbrough, Rural.	—	Nil.	—	—	—	—	—	—

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1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1891. Jan. 21 —cont.	Kirkleatham, Urban.	1891. Jan. 15	St. Vincent Terrace, Coatham.	D.	F.	39	1	—	Stockton and Middlesbrough Water Board.
		„ 15	James Row, Warrenby -	M.	M.	12	1	—	
		„ 21	Newcomen Street, Coatham.	C. G.	M.	3	1	—	
		„ 21	Teresa Terrace, Coatham	G. McK.	M.	6½	1	—	
		„ 21	Bentinek Terrace, Coatham.	A. W.	F.	4	—	1	
		„ 21	Cleveland Terrace, Coatham.	J. B.	F.	9	1	—	
	Redear, Urban -	—	Nil.	—	—	—	—	—	—
	Guisbrough, Urban.	—	Nil.	—	—	—	—	—	—
	Skelton and Brotton, Urban.	—	Nil.	—	—	—	—	—	—
	Saltburn-by-the Sea, Urban.	—	Nil.	—	—	—	—	—	—
	Loftus, Urban -	—	Nil.	—	—	—	—	—	—
	Guisbrough, Rural.	—	Nil.	—	—	—	—	—	—
	Richmond, Urban	—	Nil.	—	—	—	—	—	—
	Richmond, Rural	—	Nil.	—	—	—	—	—	—
Feb. 7	Teesdale, Rural	—	Nil.	—	—	—	—	—	—
	Barnard Castle, Urban.	—	Nil.	—	—	—	—	—	—
	Auckland, Rural	Feb. 3	Hamsterley - -	G. D.	M.	21	1	—	Well.
		„ 7	Byers Green - -	H. R.	M.	3	1	—	
	Bishop Auckland, Urban.	—	Nil.	—	—	—	—	—	—
	Shildon, Urban	—	Nil.	—	—	—	—	—	—
	Spennymoor, Urban.	—	Nil.	—	—	—	—	—	—
	Darlington, Urban.	Jan. 27	25, Freeman's Place, C. -	M. E. W.	F.	11	1	—	Darlington Corporation Waterworks.
		Feb. 2	66, Brunswick Street, C. -	J. S.	M.	19	—	1	
		„ 4	16, Farrer Street, C. -	T. J.	M.	12	—	1	
		Jan. 26	23, Park Place, S. -	M. A. W.	F.	19	1	—	
		Feb. 2	8, Beaumont Street, S. -	G. L. S.	F.	10	—	1	
		„ 3	72, Park Street, S. -	G. H. S.	M.	15	1	—	
		Jan. 26	3, East Terrace, E. -	F. T.	F.	21	—	1	
		Feb. 2	Brankin Moor, E. -	J. B.	M.	15	1	—	
		Jan. 27	43, East Raby Street, W. -	J. B.	M.	11	1	—	
		Feb. 3	7, Outram Street, W. -	F. M.	M.	12	1	—	
		Jan. 30	57, Archer Street, N.W. -	F. A.	M.	19	1	—	
	Darlington, Rural	Jan. 30	Blackwell - -	I.	F.	15	1	—	Well.
		Feb. 3	Neasham - -	A. A.	F.	11	1	—	
	Stockton-on-Tees, Urban.	Jan. 26	High Street, S.E. -	J. F.	M.	20	—	1	Stockton and Middlesbrough Water Board.
		„ 26	5, Oak Street, V. -	A. R.	F.	7	1	—	
		„ 26	1, Sun Street, S.W. -	A. J. R.	M.	2½	1	—	
		„ 26	Bowesfield Farm, S.W. -	L. I.	F.	9	1	—	
		„ 26	Gregothuan Cottage, W.E. -	H. S.	M.	7½	1	—	
		„ 26	12, Percy Street, Pa. -	S. J. G. B.	M.	15	1	—	
		„ 26	47, Adderley Street, Pa. -	McL.	F.	8	1	—	
	„ 26	„ 26	14, Frances Street, N.W. -	M. S.	F.	11	1	—	„

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1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1891. Feb. 7— cont.	Stockton - on - Tees, Urban— cont	1891. Jan. 26	8, Oxford Street, N.W. -	J. S.	F.	5	1	—	Stockton and Middlesbrough Water Board.
		" 26	12, Donald Street, N.W. -	D. L.	M.	5	—	1	" "
		" 26	10, Derby Street, S.W. -	A. J. A.	F.	9	1	—	" "
		" 26	5, Victoria Yard, E. -	A. B.	F.	8	1	—	" "
		" 27	93, Webster Street, E. -	A. B.	M.	22	1	—	" "
		" 28	22, Portrack Street, Po. -	A. S.	M.	70	1	—	" "
		" 28	6, Woodland Street, S.W.	K. B.	F.	21	1	—	" "
		" 28	24, Hutchinson Street, C.	E. J.	F.	27	1	—	" "
		" 28	4, Grove Street, S.W. -	E. E. P.	M.	26	1	—	" "
		" 29	30, Tilery Road, T. -	L. T.	F.	5	1	—	" "
		" 29	60, Alliance Street, S.W.	T. G.	F.	2 ¹ ₃	1	—	" "
		" 30	17, Garibaldi Street, N.W.	T. D.	M.	18	—	1	" "
		" 30	10, Pine Street, V. -	H. A.	M.	21	1	—	" "
		" 30	7, Albion Street, E. -	F. H.	M.	9 ¹ ₂	1	—	" "
		" 30	17, Bath Street, V. -	L. L.	M.	5	1	—	" "
		" 30	100, Lawson Street, W.E.	J. P.	M.	26	1	—	" "
		" 30	31, Windsor Road, S.W. -	O. W.	F.	6	—	1	" "
		" 30	27, Byron Street, N.W. -	M. A. M.	F.	10	—	1	" "
		" 31	88, Portrack Lane, Po. -	F. W.	M.	33	1	—	" "
		" 31	18, Moss Street, T. -	J. B.	M.	18	1	—	" "
		" 31	18, Moss Street, T. -	M. H.	F.	16	—	1	" "
		" 31	14 ¹ ₂ , Smith Street, C. -	S. M. B.	F.	4	1	—	" "
		Feb. 3	64, Webster Street, W.E.	J. I.	F.	19	1	—	" "
		" 3	14, Stanley Street, C. -	P. L.	F.	3	1	—	" "
		" 3	11, Compton Street, T. -	W. C. F.	M.	20	1	—	" "
		" 3	Castlegate, S.E. -	E. B.	F.	8	1	—	" "
		" 5	The Green, S.E. -	J. A. P.	M.	20	1	—	" "
		" 5	4, Elliot Street, Po. -	P. D.	M.	19	1	—	" "
		" 5	6, Caroline Street, Po. -	M. J.	M.	37	1	—	" "
		" 5	40, St. Ann's Terrace, Po.	S. D.	F.	11	1	—	" "
		" 5	7, Varo Street, V. -	J. N.	M.	38	1	—	" "
		" 5	7, Varo Street, V. -	H. N.	M.	38	—	1	" "
		" 6	5, Herring Street, T. -	F. W.	M.	7	—	1	" "
		" 6	6, Tennant Street, N.W.	J. A.	M.	19	1	—	" "
		" 6	11, Housewife Lane, S.E.	P. W.	F.	7	—	1	" "
		" 6	10, Alexander Street, W.E.	R. B.	M.	5	1	—	" "
		" 7	48, Adderley Street, Pa. -	E. H.	F.	8	1	—	" "
		" 7	12, Bright Street, E. -	F. L.	M.	21	—	1	" "
	Stockton, Rural	Jan. 26	39, Port Clarence -	E. R.	F.	4	1	—	" "
		" 30	Eaglescliff Junction -	G. H.	M.	8	1	—	" "
	Sedgefield, Rural	—	Nil.	—	—	—	—	—	—
	Hartlepool, Urban.	Feb. 5	8, Charles Street -	B.	F.	26	1	—	Hartlepool Water Co.
	West Hartlepool, Urban.	Jan. 26	Cumberland Street -	M. Y.	F.	23	1	—	" "
		" 26	Northumberland Street -	M. A. L.	?	49	1	—	" "
		Feb. 7	Dean Street -	E. H.	M.	20	—	1	" "
	Hartlepool, Rural	—	Nil.	—	—	—	—	—	—
	Northallerton, Urban.	—	Nil.	—	—	—	—	—	—
	Northallerton, Rural.	—	Nil.	—	—	—	—	—	—
	Stokesley, Rural	Feb. 6	Yarm - - -	F. A.	M.	8	—	1	Stockton and Middlesbrough Water Board.
	Middlesbrough, Urban.	Jan. 26	19, Innes Street, N.W. -	W. T.	M.	12	—	1	" "
		" 28	16, Peel Street, S. -	M. A. C.	F.	5	1	—	" "
		" 28	23, Welford Street, N.W.	D. P.	M.	2	1	—	" "
		" 28	18, Thorpe Street, N.W. -	L. A. B.	F.	29	1	—	" "
		" 28	22, Avon Street, N.E. -	J. J.	M.	33	1	—	" "
		" 28	119, Barritt Street, S. -	R. S.	M.	3	1	—	" "
		" 28	2, Hartington Road, S. -	M. P.	F.	33	1	—	" "
		" 29	24, Pearl Street, S. -	E. T.	F.	14	1	—	" "
		" 29	92, Vanghan Street, W. -	W. E. M.	M.	10	1	—	" "
		" 30	38, Italy Street, N.W. -	T. F.	M.	4	1	—	" "
		" 30	273, Newport Road, N.W.	E. T.	F.	19	1	—	" "
		" 30	6, Fleetham Street, S. -	E. P.	M.	12	1	—	" "
		" 30	39, Wellington Street, W.	W. M.	M.	16	1	—	" "
		" 31	Linthorpe Road (next to Hedley's), M.	R. K.	F.	16	1	—	" "

Notified during Fortnight ending	Sanitary District.	Date of Notification.	Address.	Initials of Patient.	Sex.	Age.	Primary.	Secondary.	Water Supply obtained from
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1891. Feb. 7— cont.	Middlesbrough, Urban—cont.	1891. Jan. 31	44, Albert Road, M.	R. T.	F.	22	1	—	Stockton and Middlesbrough Water Board.
		" 31	1, Market Place, M.	M. A. S.	F.	40	1	—	
		" 31	10, Robert Street, W.	E. T.	F.	1 $\frac{1}{2}$	—	1	
		" 31	North Riding Infirmary, S.	J. M.	F.	34	—	1	
		" 31	7, Lunley Street, S.	M. W.	F.	33	—	1	
		" 31	160, Union Street, S.	G. H. D.	M.	10	1	—	
		Feb. 1	22, Bennett Street, N.W.	J. D.	M.	18	1	—	
		" 2	62, Richardson Street, M.	E. R.	F.	5	1	—	
		" 2	158, Stockton Street, W.	E. W.	F.	16	1	—	
		" 3	5, Byers Yard, Stockton Street, W.	A. McF.	M.	7	1	—	
		" 3	3, Wear Street, N.E.	J. M.	M.	4	1	—	
		" 3	16, Mineral Street, N.E.	M. M.	F.	19	1	—	
		" 4	47, Vaughan Street, W.	W. G.	M.	31	—	1	
		" 5	37, Lower West Street, N.W.	C. G.	M.	9	1	—	
		" 6	53, Lincoln Street, N.W.	J. H.	M.	17	1	—	
		" 6	20, Borough Road, W.	A. C.	F.	13	—	1	
		" 6	18, Childers Street, N.W.	D. C.	M.	18	1	—	
		" 7	105, Lord Street, N.W.	S. A. G.	F.	23	1	—	
	South Stockton, Urban.	Jan. 28	16, Leonard Street	J. F.	M.	42	1	—	
		" 31	36, Stanley Grove	E. P.	F.	10	1	—	
		" 31	9, Anderson Street	J. H.	F.	3	1	—	
		Feb. 6	6, Frederick Street	M. McF.	F.	6	1	—	
		" 7	31, Chelmsford Street	S. H.	M.	5	—	1	
		" 7	22, Victor Street	A. R.	F.	10	1	—	
	Ormesby, Urban	" 7	27, Darlington Street	E. K.	M.	3 $\frac{1}{2}$	1	—	
		Jan. 27	1, Moses Street	D. W.	M.	12	1	—	
		" 29	17, Pierson Street	A. H.	F.	11	1	—	
		Feb. 5	36, Hymer Street	W. W.	M.	37	1	—	
		" 5	36, Hymer Street	P. W.	F.	11	—	1	
		" 5	36, Hymer Street	A. W.	F.	4	—	1	
	Normanby, Urban.	" 5	48, Stovin Street	W. M.	M.	23	1	—	
		" 6	29, Clarendon Street	G. W.	M.	21	1	—	
		" 6	33, Queen Street	A. W.	M.	25	1	—	
		" 6	8, Princees Street	M. W.	F.	8	1	—	
		" 6	10, York Street	D. O'N.	M.	12	1	—	
		" 6	62, Nelson Street	M. A.	F.	16	1	—	
		" 6	53, Redear Road	A. M.	F.	22	1	—	
		" 6	27, Branch Street	C. R.	M.	15	—	1	
		" 6	79, Queen Street	M. B.	F.	9	1	—	
		" 6	40, Cleveland Street	M. G.	F.	20	1	—	
	Eston, Urban	" 6	14, Cleveland Street	J. N.	M.	18	1	—	
		Jan. 30	65, Stapylton Street, Grangetown.	G. S.	M.	14	1	—	
	Middlesbrough, Rural.	—	Nil.	—	—	—	—	—	—
	Kirkleatham, Urban.	Jan. 27	Coatham	M. R.	F.	23	—	1	Stockton and Middlesbrough Water Board.
		Feb. 2	Decoy Street, Warrenby	S.	F.	25	1	—	
	Redcar, Urban	Jan. 26	Portland Terrace	N.	F.	36	1	—	Spring.
	Guisbrough, Urban.	—	Nil.	—	—	—	—	—	—
	Skelton and Brotton, Urban.	—	Nil.	—	—	—	—	—	—
	Saltburn-by-the-Sea, Urban.	—	Nil.	—	—	—	—	—	—
	Loftus, Urban	—	Nil.	—	—	—	—	—	—
	Guisbrough, Rural.	—	Nil.	—	—	—	—	—	—
	Richmond, Urban	—	Nil.	—	—	—	—	—	—
	Richmond, Rural.	—	Nil.	—	—	—	—	—	—

Notified during Fortnight ending	Sanitary District.	Date of Notification.	Address.	Initials of Patient.	Sex.	Age.	Primary.	Secondary.	Water Supply obtained from
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1891. Feb. 21 -	Teesdale, Rural	1891. —	Nil.	—	—	—	—	—	—
	Barnard Castle, Urban.	—	Nil.	—	—	—	—	—	—
	Auckland, Rural	—	Nil.	—	—	—	—	—	—
	Bishop Auckland, Urban.	—	Nil.	—	—	—	—	—	—
	Shildon, Urban	—	Nil.	—	—	—	—	—	—
	Spennymoor, Urban.	—	Nil.	—	—	—	—	—	—
	Darlington, Urban.	Feb. 13	21, Bridge Street, S.	P. T.	F.	11	1	—	Darlington Corporation Waterworks.
		„ 9	19, Carlton Street, E.	T. W. S.	M.	30	1	—	„ „
		„ 11	36, East Raby Street, W.	W. H. D.	M.	17	1	—	„ „
	Darlington, Rural.	„ 17	Middleton St. George	J. T.	M.	35	1	—	Stockton and Middlesbrough Water Board.
		„ 21	Middleton St. George	J. A. R.	F.	45	—	1	„ „
	Stockton - on - Tees, Urban.	„ 9	14, Herbert Street, V.	A. C.	F.	3 $\frac{1}{2}$	1	—	„ „
		„ 9	39, Joseph Street, Po.	A. C.	F.	36	1	—	„ „
		„ 9	40, Hampton Road, S.W.	S. H.	F.	45	1	—	„ „
		„ 9	6, Derby Street, S.W.	J. G.	M.	39	1	—	„ „
		„ 9	9, Brunswick Street, E.	E. H.	F.	30	1	—	„ „
		„ 9	11, Richmond Street, N.W.	H. P.	M.	42	1	—	„ „
		„ 10	Royal William, V.	R. P.	M.	29	1	—	„ „
		„ 11	2, Union Street, Po.	J. E. B.	M.	14	—	1	„ „
		„ 11	1, Clarence Row, Po.	E. McD.	F.	2	1	—	„ „
		„ 12	9, East Street, C.	J. V.	M.	17	1	—	„ „
		„ 12	10, Neasham Street, V.	J. P.	M.	9	—	1	„ „
		„ 13	8, Henry Street, Po.	L. M.	F.	5	1	—	„ „
		„ 13	7, Seaham Street, T.	M. A. C.	F.	5	1	—	„ „
		„ 16	15, Herbert Street, V.	T. S.	M.	15	—	1	„ „
		„ 17	10, Neasham Street, V.	T. P.	M.	15	—	1	„ „
		„ 17	4, Alexander Street, W. E.	C. E. J.	F.	7	1	—	„ „
		„ 19	11, Routledge Street, T.	A. J. B.	F.	30	—	1	„ „
		„ 21	19, Lambert Street, Po.	E. E.	F.	4	1	—	„ „
		„ 21	6, Compton Street, T.	W. W.	M.	9	1	—	„ „
	Stockton, Rural	„ 12	4, Clarence Street, Haver-	M. P.	F.	8	—	1	„ „
		„ 18	ton. 125, Port Clarence	F. B.	M.	15	1	—	„ „
	Sedgefield, Rural	—	Nil.	—	—	—	—	—	—
	Hartlepool, Urban.	—	Nil.	—	—	—	—	—	—
	West Hartlepool, Urban.	—	Nil.	—	—	—	—	—	—
	Hartlepool, Rural.	—	Nil.	—	—	—	—	—	—
	Northallerton, Urban.	—	Nil.	—	—	—	—	—	—
	Northallerton, Rural.	—	Nil.	—	—	—	—	—	—
	Stokesley, Rural	—	Nil.	—	—	—	—	—	—
	Middlesbrough, Urban.	Feb. 9	223, Cannon Street, N.W.	M. B.	F.	7	1	—	Stockton and Middlesbrough Water Board.
		„ 9	11, Lime Street, N.W.	N. A.	F.	43	—	1	„ „
		„ 9	59, Adam Street, N.W.	R. S.	F.	11	1	—	„ „
		„ 9	27, Avon Street, N.E.	M. H.	F.	55	1	—	„ „
		„ 9	56, Marton Road, N.E.	H. W.	F.	27	1	—	„ „

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1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1891. Feb. 21— cont.	Middlesbrough, Urban—cont.	1891. Feb. 9	24, High Feversham Street, M.	H. A. T.	F.	18	1	—	Stockton and Middlesbrough Water Board.
		" 9	24, High Feversham Street, M.	E. M. T.	F.	15	—	1	
		" 9	41, Harris Street, S.	J. W. H.	F.	17	1	—	" "
		" 9	41, Harris Street, S.	R. H.	M.	8	—	1	" "
		" 9	6, Hanson Street, S.	W. R.	M.	14	1	—	" "
		" 9	25, Grange Road West, W.	M. D.	F.	25	1	—	" "
		" 10	33, Buxton Street, M.	M. J. D.	F.	10	1	—	" "
		" 10	31, Blake Street, N.E.	S. B.	F.	14	1	—	" "
		" 11	7, Waterloo Road, M.	M. B.	F.	10	1	—	" "
		" 11	72, School Croft, N.E.	R. T.	M.	7	—	1	" "
		" 11	16, Elm Street, M.	T. H.	M.	41	1	—	" "
		" 12	18, Walker Street, N.W.	T. E.	M.	14	—	1	" "
		" 14	Municipal Buildings, M.	H. W.	M.	9	1	—	" "
		" 14	Municipal Buildings, M.	R. W.	M.	7	—	1	" "
		" 14	9, Disraeli Street, N.W.	E. N.	F.	8	1	—	" "
		" 14	6, Alexandria Street, N.W.	A. P. B.	F.	54	1	—	" "
		" 15	9, Salisbury Street, N.W.	E. H.	F.	64	1	—	" "
		" 16	30, Colne Street, N.E.	R. P.	F.	20	1	—	" "
		" 17	11, Carter Street, N.W.	L. G.	F.	10	1	—	" "
		" 17	35, Bargate Street, N.W.	W. W. S.	M.	20	1	—	" "
		" 17	17, Dale Street, W.	W. T. P.	M.	21	1	—	" "
		" 18	30, Calthorpe Street, N.W.	A. H.	F.	14	1	—	" "
		" 18	13, Lincoln Street, N.W.	W. H. D.	M.	11	1	—	" "
		" 18	52, Gray Street, N.E.	S. A. W.	F.	7 $\frac{1}{2}$	1	—	" "
		" 19	2, Peacock's Yard, Dacre Street, N.E.	C. McM.	F.	12	—	1	" "
		" 19	North Riding Infirmary, S.	D. G.	M.	68	—	1	" "
		" 20	38, Gilkes Street, W.	H. W.	M.	31	1	—	" "
		" 20	66, Grange Road, East, M.	N. R.	F.	15	1	—	" "
		" 20	Park Road, North, M.	E. J. K.	F.	23	1	—	" "
		" 20	Municipal Buildings, M.	G. W.	M.	4	—	1	" "
		" 20	55, Hunter Street N.E.	R. H.	M.	27	1	—	" "
	South Stockton, Urban.	" 11	27, Darlington Street	A. K.	F.	11	—	1	" "
		" 11	27, Darlington Street	A. K.	F.	13	—	1	" "
		" 13	10, Chapel Street	P. F.	M.	10	1	—	" "
		" 16	25, Skinner Street	N. J. G.	F.	6	1	—	" "
		" 16	15, Hannah Street	D. P.	M.	27	1	—	" "
		" 17	9, Leeds Street	L. W.	F.	5	1	—	" "
		" 18	15, Simpson Street	J. G. T.	M.	16	1	—	" "
		" 18	25, Victor Street	J. T. M.	M.	9	1	—	" "
		" 19	4, Butterwick Place	A. S.	F.	8	1	—	" "
	Ormesby, Urban	" 9	48, James Street	M. B.	F.	18	1	—	" "
		" 12	47, Levin Street	M. McD.	F.	18	1	—	" "
		" 18	41, Nelson Street	M. J. G.	F.	7	1	—	" "
	Normanby, Urban.	—	Nil.	—	—	—	—	—	—
	Eston, Urban	Feb. 9	13, Jackson's Street, Eston	S. J.	F.	11	1	—	Stockton and Middlesbrough Water Board.
		" 11	39, Codd Street, South Bank.	L. G.	F.	10	1	—	
		" 14	42, Wood Street, Grange-town.	H. F.	M.	4	1	—	" "
		" 17	94, Cheetham Street, Grangetown.	E. L.	F.	16	1	—	" "
		" 17	40, Vickers Street, Grange-town.	E. F.	F.	4	1	—	" "
		" 18	98, Vaughan Street, Grangetown.	J. M.	F.	5	1	—	" "
		" 20	18, Miles Street, South Bank.	E. C.	F.	21	1	—	" "
		" 20	31, Munby Street, South Bank.	H. F.	F.	1 $\frac{1}{2}$	—	1	" "
	Middlesbrough, Rural.	—	Nil.	—	—	—	—	—	—
	Kirkleatham, Urban.	Feb. 16	Lobster Road, Coatham	L.	F.	13	1	—	Stockton and Middlesbrough Water Board.
		" 16	1, Cleveland Terrace, Coatham.	M. B.	M.	6	—	1	
	Redcar, Urban	—	Nil.	—	—	—	—	—	—
	Guisbrough, Urban.	—	Nil.	—	—	—	—	—	—

Notified during Fortnight ending	Sanitary District.	Date of Notification.	Address.	Initials of Patient.	Sex.	Age.	Primary.	Secondary.	Water Supply obtained from
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1891. Feb. 21— cont.	Skelton and Brotton, Urban.	1891. —	Nil.	—	—	—	—	—	—
	Saltburn-by-the-Sea, Urban.	—	Nil.	—	—	—	—	—	—
	Loftus, Urban	—	Nil.	—	—	—	—	—	—
	Guisbrough, Rural.	—	Nil.	—	—	—	—	—	—
	Richmond, Urban	—	Nil.	—	—	—	—	—	—
Mar. 7	Richmond, Rural	—	Nil.	—	—	—	—	—	—
	Teesdale, Rural	—	Nil.	—	—	—	—	—	—
	Barnard Castle, Urban.	—	Nil.	—	—	—	—	—	—
	Auckland, Rural	—	Nil.	—	—	—	—	—	—
	Bishop Auckland, Urban.	—	Nil.	—	—	—	—	—	—
	Shildon, Urban	—	Nil.	—	—	—	—	—	—
	Spennymoor, Urban.	Mar. 3	High Street - -	C. H.	M.	44	1	—	Weardale and Shildon Water Co.
	Darlington, Urban.	" 3	21, Chapel Street, S. -	S. C.	M.	7	1	—	Darlington Corporation Waterworks.
		" 3	17, King Street, N.W. -	K. N.	F.	19	—	1	" "
		" 4	42, Swan Street, S. -	J. C.	F.	13	1	—	" "
		" 4	75, Prescott Street, E. -	H. H.	M.	65	1	—	" "
		" 7	10, Arden Street, S. -	F. S.	F.	15	1	—	" "
		" 7	11, Chesnut Street, C. -	A. H.	F.	61	—	1	" "
	Darlington, Rural.	" 3	Prior Street, Cockerton -	H. C.	M.	5	1	—	" "
	Stockton - on - Tees, Urban.	Feb. 23	19, Lambert Street, Po. -	E. F.	M.	5	—	1	Stockton and Middlesbrough Water Board.
		" 23	4, Stanley Street, C. -	F. L.	F.	16	—	1	" "
		" 23	4, Stanley Street, C. -	P. L.	F.	35	—	1	" "
		" 25	27, Waverley Street, Pa. -	F. B.	M.	19	1	—	" "
		" 25	11, Herbert Street, V. -	E. S.	F.	19	1	—	" "
		" 25	19, Lambert Street, Po. -	R. A. A.	F.	25	—	1	" "
		" 25	5, Barrett Street, Po. -	T. D.	M.	27	1	—	" "
		" 26	Ramsgate, E. -	A. H.	F.	5	1	—	" "
		" 27	24, Crisp Street, T. -	R. D.	M.	21	1	—	" "
		Mar. 5	21, Allison Street, C. -	N. K.	F.	7	1	—	" "
		" 6	3, Bickersteth Street, Pa. -	M. B.	F.	6	1	—	" "
		" 7	7, Compton Street, T. -	M. E. B.	F.	5 $\frac{1}{2}$	1	—	" "
		" 7	51, Thorp Street, V. -	W. G. R.	M.	16	1	—	" "
	Stockton, Rural	Feb. 25	Eaglescliff Junction -	H. D.	M.	7	1	—	" "
		" 26	3, Temperance Street, Haverton.	K.	?	50	1	—	" "
		Mar. 2	Haverton Hill - -	M. C.	?	25	1	—	" "
		" 6	Haverton Hill - -	W. J.	M.	29	1	—	" "
	Sedgefield, Rural	—	Nil.	—	—	—	—	—	—
	Hartlepool, Urban.	Mar. 7	14, Frederick Street -	T.	M.	13	1	—	Hartlepool Water Co.
	West Hartlepool, Urban.	Feb. 27	Cromwell Street - -	P. S.	F.	11	1	—	Well.
		" 28	Cumberland Street -	J. W.	M.	36	1	—	Hartlepool Water Co.
		Mar. 6	29, Dent Street - -	H. N.	M.	6	1	—	Pump.
		" 6	29, Dent Street - -	B. N.	F.	5	—	1	"

Notified during Fortnight ending	Sanitary District.	Date of Notification.	Address.	Initials of Patient.	Sex.	Age.	Primary.	Secondary.	Water Supply obtained from
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1891. Mar. 7— cont.	Hartlepool, Rural	1891. —	Nil.	—	—	—	—	—	—
	Northallerton, Urban.	—	Northallerton - -	C. J. B.	M.	25	1	—	Well.
	Northallerton, Rural.	—	Nil.	—	—	—	—	—	—
	Stokesley, Rural	—	Nil.	—	—	—	—	—	—
	Middlesbrough, Urban.	Feb. 22	23, Welford Street, N.W.	M. A. P.	F.	6	—	1	Stockton and Middlesbrough Water Board.
		" 22	5, James Street, N.E. -	J. S.	M.	17	1	—	" "
		" 22	4, Robinson Yard, N.E. -	A. W.	F.	6	1	—	" "
		" 23	31, Wellington Street, W.	M. H.	F.	2	1	—	" "
		" 23	32, School Croft, N.E. -	E. T.	F.	5	1	—	" "
		" 23	5, Stone Street, N.E. -	R. R.	M.	7	1	—	" "
		" 26	32, Waterloo Road, M. -	L. H.	F.	8	1	—	" "
		" 26	Industrial School, S. -	W. F.	M.	15	1	—	" "
		" 28	65, Denmark Street, N.W.	D. L.	M.	5½	1	—	" "
		Mar. 2	1, Cardwell Street, W. -	J. E.	M.	23	1	—	" "
		" 2	59, Vaughan Street, E. -	J. M.	M.	17	1	—	" "
		" 2	57, Disraeli Street, W. -	W. G.	M.	4½	1	—	" "
		" 3	12, Harrison Street, W. -	M. A. L.	F.	39	—	1	" "
		" 3	44, Banks Street, W. -	D. M.	F.	8	1	—	" "
		" 3	23, Welford Street, W. -	T. P.	M.	10	—	1	" "
		" 4	Barritt's Yard, N. -	M. R.	M.	5	1	—	" "
		" 4	4, Harrison Street, W. -	W. B.	M.	15	1	—	" "
		" 5	85, Bulmer Street, W. -	E. T.	F.	5	1	—	" "
		" 6	4, Harrison Street, W. -	W. B.	M.	15	—	1	" "
		" 6	8, Johnson Street, E. -	S. C.	F.	14	1	—	" "
		" 7	31, Jamieson Street, W. -	C. E.	F.	15	1	—	" "
		" 7	27, Earnest Street, W. -	E. B.	M.	3½	1	—	" "
	South Stockton, Urban.	Feb. 22	2, Cobden Street -	E. B.	F.	6	1	—	" "
		" 27	6, Frederick Street -	M. McF.	F.	8	—	1	" "
		" 27	28, Glasgow Street -	J. L.	M.	10	1	—	" "
		" 28	7, Chelmsford Street -	M. E. H.	F.	7	1	—	" "
	Ormesby, Urban	—	Nil.	—	—	—	—	—	—
	Normanby, Urban.	Feb. 26	67, Oxford Street -	E. D.	M.	21	1	—	Stockton and Middlesbrough Water Board.
	Eston, Urban -	" 23	13, West Street, Eston -	J. L.	M.	6½	1	—	" "
		Mar. 3	23, William Street, Eston -	M. A. B.	?	14½	1	—	" "
		" 3	50, West Street, Eston -	J. P.	M.	7	1	—	" "
		" 5	12, Bolekow Terrace -	E. K.	M.	4	1	—	" "
		" 5	115, Vicker Street -	C. W. C.	?	7	1	—	" "
		" 5	40, Vicker Street -	R. F.	?	3	—	1	" "
		" 5	31, Stapylton Street -	J. L.	M.	38	1	—	" "
	Middlesbrough, Rural.	" 22	9, Ayresome Road -	G. S. N.	M.	22	1	—	" "
	Kirkleatham, Urban.	—	Nil.	—	—	—	—	—	—
	Redcar, Urban -	—	Nil.	—	—	—	—	—	—
	Guisbrough, Urban.	—	Nil.	—	—	—	—	—	—
	Skelton and Brotton, Urban.	—	Nil.	—	—	—	—	—	—
	Saltburn-by-the-Sea, Urban.	—	Nil.	—	—	—	—	—	—
	Loftus, Urban -	—	Nil.	—	—	—	—	—	—
	Guisbrough, Rural.	—	Nil.	—	—	—	—	—	—

Notified during Fortnight ending	Sanitary District.	Date of Notification.	Address.	Initials of Patient.	Sex.	Age.	Primary.	Secondary.	Water Supply obtained from
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1891. Mar. 7— <i>cont.</i>	Richmond, Urban.	1891. —	Nil.	—	—	—	—	—	—
	Richmond, Rural.	—	Nil.	—	—	—	—	—	—
Mar. 21	Teesdale, Rural	—	Nil.	—	—	—	—	—	—
	Barnard Castle, Urban.	—	Nil.	—	—	—	—	—	—
	Auckland, Rural	—	Nil.	—	—	—	—	—	—
	Bishop Auckland, Urban.	—	Nil.	—	—	—	—	—	—
	Shildon and East Thiekley, Urban.	Mar. 9	Chapel Street, New Shildon.	J. W. B.	M.	24	1	—	Weardale and Shildon Water Co.
	Spennymoor, Urban.	—	Nil.	—	—	—	—	—	—
	Darlington, Urban.	Mar. 12	31, Grey Street, E. -	T. O'H.	M.	19	1	—	Darlington Corporation Waterworks.
		" 19	16, Alfred Street, N.	J. T.	M.	26	9	—	" "
		" 20	7, Selborne Terrace, N. W.	E. McM.	M.	4	1	—	" "
		" 20	43, Allen Street, E.	A. S.	F.	7	1	—	" "
	Darlington, Rural.	—	Nil.	—	—	—	—	—	—
	Stockton-on-Tees, Urban.	Mar. 9	12, Station Street, C. -	W. J.	M.	37	1	—	Stockton and Middlesbrough Water Board.
		" 10	21, Allison Street, C. -	W. K.	M.	6	—	1	" "
		" 10	21, Allison Street, C. -	A. K.	M.	2	—	1	" "
		" 13	24, Temple Street, S.W. -	M. J. Mc N.	F.	24	1	—	" "
		" 13	6, West End Terrace, S.W.	A. B. W.	M.	15	1	—	" "
		" 15	39, Suffolk Street, W.E. -	J. W.	M.	40	1	—	" "
		" 16	3, Alice Street, W.E. -	A. S.	F.	11	1	—	" "
		" 17	42, Brunswick Street, E. -	W. G.	M.	7	1	—	" "
		" 18	19, Vine Street, Pa. -	W. F.	M.	5	1	—	" "
		" 19	42, Arlington Street, Pa. -	A. H.	M.	30	1	—	" "
		" 20	7, East Street, C. -	F. F.	M.	6	1	—	" "
	Stockton, Rural	" 12	Port Clarence -	G. D.	M.	42	1	—	" "
	Sedgefield, Rural	—	Nil.	—	—	—	—	—	—
	Hartlepool, Urban.	Mar. 9	78, High Street -	R.	F.	8	1	—	Hartlepool Water Co.
		" 10	11, High Street -	S.	F.	11	1	—	" "
		" 18	11, High Street -	S.	M.	7	—	1	" "
		" 18	11, High Street -	T.	F.	12	—	1	" "
		" 18	11, High Street -	T.	M.	11	—	1	" "
	West Hartlepool, Urban.	—	Nil.	—	—	—	—	—	—
	Hartlepool, Rural.	—	Nil.	—	—	—	—	—	—
	Northallerton, Urban.	—	Nil.	—	—	—	—	—	—
	Northallerton, Rural.	—	Nil.	—	—	—	—	—	—
	Stokesley, Rural	—	Nil.	—	—	—	—	—	—

Notified during Fortnight ending	Sanitary District.	Date of Notification.	Address.	Initials of Patient.	Sex.	Age.	Primary.	Secondary.	Water Supply obtained from.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1891. Mar. 21— cont.	Middlesbrough, Urban.	1891. Mar. 8	167, Newport Road, N.W.	E. M.	F.	20	1	—	Stockton and Middles- brough Water Board.
		" 9	21, Bank Street, N.W. -	F. M.	F.	8½	1	—	
		" 9	20, Hartington Street, W.	M. G.	F.	5	1	—	
		" 11	5, Adam Street, N.W. -	J. G.	M.	3½	1	—	
		" 12	4, Teare Street, S. -	J. D.	M.	7	1	—	
		" 12	23, Bowley Street, S. -	J. D. S.	M.	35	1	—	
		" 12	3, Balder Street, N.E. -	F. M.	M.	9	1	—	
		" 12	3, Balder Street, N.E. -	G. M.	M.	8	—	1	
		" 12	3, Balder Street, N.E. -	T. M.	M.	6	—	1	
		" 14	59, Kendal Street, N.W. -	W. F.	M.	27	1	—	
		" 15	17, Benjamin Street, N.W.	L. M.	M.	21	1	—	
		" 15	11, Lime Street, N.W. -	M. J. A.	F.	20	—	1	
		" 17	27, Derwent Street, N.W.	J. H.	M.	24	1	—	
		" 17	13, Henry Street, N.W. -	F. O. C.	M.	12	1	—	
		" 18	23, Welford Street, N.W.	M. P.	F.	30	1	—	
		" 18	21, Rockcliffe Street, N.W.	E. P.	F.	23	1	—	
		" 18	26, Peel Street, S. -	T. J. H.	M.	11	1	—	
		" 18	29, Bowley Street, S. -	E. F. P.	M.	12	1	—	
		" 20	25, Elm Street, M. -	L. H.	F.	3	1	—	
		" 20	16, Elm Street, M. -	T. H.	M.	5	—	1	
		" 20	20, Calthorpe Street, N.W.	A. E. P.	M.	5	1	—	
		" 20	223, Cannon Street, N.W.	M. A. B.	F.	17	—	1	
		" 21	18, Colne Street, N.E. -	H. E. M.	F.	5	1	—	
	South Stockton, Urban.	" 10	28, Glasgow Street -	H. L.	F.	4	—	1	
		" 12	10, Henrietta Street -	J. C.	M.	33	1	—	
		" 13	17, Darlington Street -	H. B.	M.	22	1	—	
		" 21	20, Trafalgar Street -	D. S.	M.	19	1	—	
	Ormesby, Urban	" 21	8, Market Place -	A. J.	M.	45	1	—	
	Normanby, Urban.	" 11	14, Redcar Road, S.B. -	C. F.	F.	8	1	—	Well.
		" 16	2, Laird Street, Normanby	A. F.	M.	13	1	—	
	Eston, Urban -	" 9	14, West Street, South Eston.	H. D.	F.	36	1	—	Stockton and Middles- brough Water Board.
	Middlesbrough, Rural.	—	Nil.	—	—	—	—	—	—
	Kirkleatham, Urban.	—	Nil.	—	—	—	—	—	—
	Redcar, Urban -	—	Nil.	—	—	—	—	—	—
	Guisbrough, Urban.	—	Nil.	—	—	—	—	—	—
	Skelton and Brot- ton, Urban.	—	Nil.	—	—	—	—	—	—
	Saltburn-by-the- Sea, Urban.	—	Nil.	—	—	—	—	—	—
	Loftus, Urban -	—	Nil.	—	—	—	—	—	—
	Guisbrough, Rural.	—	Nil.	—	—	—	—	—	—
	Richmond, Ur- ban.	—	Nil.	—	—	—	—	—	—
	Richmond, Rural.	—	Nil.	—	—	—	—	—	—

APPENDIX C.

DAILY PUMPINGS OF WATER FROM THE RIVER TEES.

(1) STATEMENT showing QUANTITY of WATER PUMPED Day by Day from the RIVER TEES at the WORKS of the DARLINGTON CORPORATION.

Date.	Quantity of Water Pumped in Gallons.	Date.	Quantity of Water Pumped in Gallons.	Date.	Quantity of Water Pumped in Gallons.
1890.		1890.		1890.	
July 1 - - -	1,755,950	September 1 - -	1,843,930	November 1 - -	2,136,496
" 2 - - -	1,976,784	" 2 - -	1,814,694	" 2 - -	660,402
" 3 - - -	1,780,724	" 3 - -	1,915,748	" 3 - -	2,052,192
" 4 - - -	1,736,522	" 4 - -	1,912,478	" 4 - -	2,112,110
" 5 - - -	1,904,192	" 5 - -	1,903,480	" 5 - -	1,952,210
" 6 - - -	606,366	" 6 - -	1,856,946	" 6 - -	1,989,406
" 7 - - -	1,768,284	" 7 - -	543,096	" 7 - -	1,881,894
" 8 - - -	2,008,092	" 8 - -	2,040,192	" 8 - -	2,014,858
" 9 - - -	1,987,574	" 9 - -	1,988,302	" 9 - -	734,274
" 10 - - -	1,971,150	" 10 - -	1,978,498	" 10 - -	1,123,536
" 11 - - -	1,733,892	" 11 - -	2,004,972	" 11 - -	2,129,460
" 12 - - -	2,043,240	" 12 - -	1,928,648	" 12 - -	2,155,296
" 13 - - -	600,894	" 13 - -	1,706,994	" 13 - -	2,098,872
" 14 - - -	2,024,684	" 14 - -	587,670	" 14 - -	1,920,204
" 15 - - -	2,081,758	" 15 - -	1,993,092	" 15 - -	1,921,424
" 16 - - -	2,005,206	" 16 - -	1,891,972	" 16 - -	565,782
" 17 - - -	1,606,498	" 17 - -	1,907,386	" 17 - -	2,091,588
" 18 - - -	2,059,208	" 18 - -	1,813,832	" 18 - -	2,050,458
" 19 - - -	1,970,332	" 19 - -	1,809,780	" 19 - -	1,978,654
" 20 - - -	570,342	" 20 - -	1,655,778	" 20 - -	1,948,100
" 21 - - -	2,062,052	" 21 - -	506,958	" 21 - -	1,823,930
" 22 - - -	2,098,066	" 22 - -	1,941,982	" 22 - -	1,951,760
" 23 - - -	2,130,566	" 23 - -	1,753,486	" 23 - -	Nil.
" 24 - - -	2,127,476	" 24 - -	1,853,662	" 24 - -	1,945,304
" 25 - - -	2,061,896	" 25 - -	1,947,756	" 25 - -	2,013,600
" 26 - - -	1,954,012	" 26 - -	2,063,542	" 26 - -	1,856,162
" 27 - - -	546,744	" 27 - -	2,049,902	" 27 - -	2,022,138
" 28 - - -	2,020,064	" 28 - -	1,467,408	" 28 - -	2,054,686
" 29 - - -	2,109,578	" 29 - -	1,956,108	" 29 - -	1,838,880
" 30 - - -	2,104,572	" 30 - -	2,178,670	" 30 - -	655,614
" 31 - - -	2,091,494				
Total - -	55,498,212	Total - -	52,816,962	Total - -	51,679,290
August 1 - - -	2,088,230	October 1 - -	2,043,652	December 1 - -	1,834,936
" 2 - - -	2,023,922	" 2 - -	2,075,188	" 2 - -	2,018,116
" 3 - - -	621,414	" 3 - -	2,036,420	" 3 - -	2,076,008
" 4 - - -	2,073,200	" 4 - -	2,019,670	" 4 - -	2,111,196
" 5 - - -	2,003,984	" 5 - -	1,875,444	" 5 - -	1,976,568
" 6 - - -	2,069,414	" 6 - -	2,191,412	" 6 - -	1,957,944
" 7 - - -	2,084,268	" 7 - -	2,044,802	" 7 - -	581,856
" 8 - - -	2,076,186	" 8 - -	2,090,328	" 8 - -	2,068,156
" 9 - - -	1,917,206	" 9 - -	2,103,744	" 9 - -	2,103,204
" 10 - - -	1,744,246	" 10 - -	2,289,436	" 10 - -	2,024,014
" 11 - - -	1,883,202	" 11 - -	2,027,190	" 11 - -	2,039,804
" 12 - - -	1,914,200	" 12 - -	2,010,134	" 12 - -	2,070,544
" 13 - - -	1,497,732	" 13 - -	2,236,852	" 13 - -	1,828,218
" 14 - - -	1,739,284	" 14 - -	2,302,040	" 14 - -	695,400
" 15 - - -	2,147,990	" 15 - -	2,309,024	" 15 - -	2,014,572
" 16 - - -	1,764,380	" 16 - -	2,204,984	" 16 - -	2,003,138
" 17 - - -	843,780	" 17 - -	2,177,806	" 17 - -	1,786,170
" 18 - - -	1,844,246	" 18 - -	2,239,368	" 18 - -	1,984,910
" 19 - - -	2,080,374	" 19 - -	1,474,134	" 19 - -	2,049,904
" 20 - - -	2,083,272	" 20 - -	2,273,402	" 20 - -	1,946,026
" 21 - - -	1,645,950	" 21 - -	2,348,046	" 21 - -	996,816
" 22 - - -	1,853,558	" 22 - -	2,113,756	" 22 - -	2,061,196
" 23 - - -	1,628,706	" 23 - -	2,178,294	" 23 - -	2,149,168
" 24 - - -	558,600	" 24 - -	2,201,336	" 24 - -	2,173,912
" 25 - - -	1,970,522	" 25 - -	2,119,254	" 25 - -	1,516,200
" 26 - - -	2,003,864	" 26 - -	1,417,134	" 26 - -	1,911,784
" 27 - - -	1,896,430	" 27 - -	2,072,128	" 27 - -	1,853,616
" 28 - - -	1,814,156	" 28 - -	2,228,962	" 28 - -	1,014,258
" 29 - - -	1,816,118	" 29 - -	2,137,650	" 29 - -	2,053,724
" 30 - - -	1,762,048	" 30 - -	2,129,820	" 30 - -	2,312,368
" 31 - - -	584,934	" 31 - -	2,069,828	" 31 - -	2,112,736
Total - -	54,035,916	Total - -	65,041,238	Total - -	57,326,462

(2) STATEMENT showing QUANTITY of WATER PUMPED Day by Day from the RIVER TEES at the
WORKS of the STOCKTON AND MIDDLESBROUGH WATER BOARD.

Date.				Engines.					Total.
				No. 1.	No. 2.	No. 3.	No. 4.	No. 5.	
				Gallons.	Gallons.	Gallons.	Gallons.	Gallons.	Gallons.
July	1	-	-	1,294,000	1,293,000			5,921,000	8,508,000
"	2	-	-	1,280,000	1,281,000			1,929,000	4,490,000
"	3	-	-	1,287,000	1,288,000			7,097,000	9,672,000
"	4	-	-	1,286,000	1,288,000			7,093,000	9,667,000
"	5	-	-	1,277,000	1,295,000			7,112,000	9,684,000
"	6	-	-	1,289,000	1,290,000			7,042,000	9,621,000
"	7	-	-	1,283,000	1,283,000			7,029,000	9,595,000
"	8	-	-	1,298,000	1,298,000			6,904,000	9,500,000
"	9	-	-	1,297,000	1,298,000			6,898,000	9,493,000
"	10	-	-	1,305,000	1,305,000			6,900,000	9,510,000
"	11	-	-	1,297,000	1,298,000			6,884,000	9,479,000
"	12	-	-	1,293,000	1,294,000			6,887,000	9,474,000
"	13	-	-	1,301,000	1,301,000			5,884,000	8,486,000
"	14	-	-	1,290,000	1,291,000			5,500,000	8,081,000
"	15	-	-	1,301,000	1,302,000			7,020,000	9,623,000
"	16	-	-	1,297,000	1,298,000			7,009,000	9,604,000
"	17	-	-	1,294,000	1,295,000			6,995,000	9,584,000
"	18	-	-	1,299,000	1,299,000			6,837,000	9,435,000
"	19	-	-	1,104,000	1,102,000			6,721,000	8,927,000
"	20	-	-	1,296,000	1,297,000			6,676,000	9,269,000
"	21	-	-	1,266,000	1,261,000			6,753,000	9,280,000
"	22	-	-	1,255,000	1,150,000			6,836,000	9,241,000
"	23	-	-	1,279,000	1,221,000			6,836,000	9,336,000
"	24	-	-	1,295,000	1,296,000			6,863,000	9,454,000
"	25	-	-	1,301,000	1,302,000			6,898,000	9,501,000
"	26	-	-	1,303,000	1,304,000			6,917,000	9,524,000
"	27	-	-	1,290,000	1,291,000			6,634,000	9,215,000
"	28	-	-	1,295,000	1,284,000			5,941,000	8,520,000
"	29	-	-	1,291,000	1,265,000			6,984,000	9,540,000
"	30	-	-	1,300,000	1,301,000			7,023,000	9,624,000
"	31	-	-	1,297,000	1,297,000			7,029,000	9,623,000
				39,840,000	39,668,000			205,052,000	284,560,000
August	1	-	-	1,299,000	1,300,000			7,056,000	9,655,000
"	2	-	-	1,304,000	1,304,000			7,188,000	9,796,000
"	3	-	-	1,303,000	1,304,000			7,119,000	9,726,000
"	4	-	-	1,106,000	1,114,000			7,151,000	9,371,000
"	5	-	-	1,374,000	1,376,000			4,816,000	7,566,000
"	6	-	-	1,391,000	1,391,000			7,178,000	9,960,000
"	7	-	-	1,397,000	1,398,000			7,178,000	9,973,000
"	8	-	-	1,412,000	1,413,000			7,190,000	10,015,000
"	9	-	-	1,420,000	1,416,000			7,194,000	10,030,000
"	10	-	-	1,353,000	1,361,000			7,150,000	9,864,000
"	11	-	-	1,369,000	1,364,000			7,161,000	9,891,000
"	12	-	-	1,357,000	1,363,000			6,782,000	9,502,000
"	13	-	-	1,359,000	1,360,000			6,436,000	9,155,000
"	14	-	-	1,367,000	1,369,000			6,810,000	9,576,000
"	15	-	-	1,369,000	1,371,000			6,233,000	8,973,000
"	16	-	-	1,360,000	1,361,000			6,498,000	9,219,000
"	17	-	-	1,370,000	1,370,000			6,607,000	9,347,000
"	18	-	-	1,366,000	1,366,000			6,725,000	9,457,000
"	19	-	-	1,370,000	1,371,000			6,457,000	9,198,000
"	20	-	-	1,373,000	1,374,000			6,209,000	8,956,000
"	21	-	-	1,367,000	1,367,000			6,737,000	9,471,000
"	22	-	-	1,371,000	1,372,000			6,776,000	9,519,000
"	23	-	-	1,331,000	1,325,000			5,043,000	7,699,000
"	24	-	-	1,237,000	1,243,000			5,065,000	7,545,000
"	25	-	-	1,279,000	1,281,000			6,438,000	8,998,000
"	26	-	-	1,294,000	1,294,000			6,336,000	8,924,000
"	27	-	-	1,276,000	1,277,000			6,556,000	9,109,000
"	28	-	-	1,287,000	1,288,000			6,808,000	9,383,000
"	29	-	-	1,130,000	1,105,000			6,982,000	9,217,000
"	30	-	-	1,337,000	1,337,000			6,959,000	9,633,000
"	31	-	-	1,340,000	1,341,000			7,004,000	9,685,000
				41,268,000	41,276,000			205,872,000	288,416,000

(2) STATEMENT showing QUANTITY of WATER PUMPED Day by Day from the RIVER TEES at the WORKS of the STOCKTON AND MIDDLESBROUGH WATER BOARD—*continued.*

Date.	Engines.					Total.
	No. 1.	No. 2.	No. 3.	No. 4.	No. 6.	
	Gallons.	Gallons.	Gallons.	Gallons.	Gallons.	
September 1	-	-	1,344,000		7,106,000	9,794,000
" 2	-	-	1,348,000		7,037,000	9,734,000
" 3	-	-	1,347,000		6,749,000	9,444,000
" 4	-	-	1,347,000		6,687,000	9,381,000
" 5	-	-	1,347,000		6,773,000	9,468,000
" 6	-	-	1,363,000		7,094,000	9,814,000
" 7	-	-	1,336,000		7,155,000	9,836,000
" 8	-	-	1,342,000		7,165,000	9,851,000
" 9	-	-	1,349,000		7,186,000	9,884,000
" 10	-	-	1,340,000	509,000	7,177,000	10,367,000
" 11	-	-	1,310,000	308,000	7,034,000	9,962,000
" 12	-	-	1,325,000		7,114,000	9,765,000
" 13	-	-	1,358,000		7,177,000	9,893,000
" 14	-	-	1,346,000		7,108,000	9,800,000
" 15	-	-	1,347,000	58,000	5,852,000	8,604,000
" 16	-	-	1,346,000	2,186,000		4,879,000
" 17	-	-	1,348,000	2,826,000		5,523,000
" 18	-	-	1,357,000	2,543,000		5,258,000
" 19	-	-	1,400,000	2,637,000		5,438,000
" 20	-	-	1,410,000	2,778,000		5,598,000
" 21	-	-	1,419,000	2,619,000		5,458,000
" 22	-	-	1,419,000	2,596,000		5,434,000
" 23	-	-	1,344,000	2,516,000	2,996,000	8,201,000
" 24	-	-	1,315,000	2,308,000	6,752,000	11,691,000
" 25	-	-	1,331,000	2,348,000	6,948,000	11,959,000
" 26	-	-	1,328,000	2,391,000	6,938,000	11,986,000
" 27	-	-	1,293,000	1,824,000	6,852,000	11,264,000
" 28	-	-	1,331,000		6,664,000	9,327,000
" 29	-	-	1,404,000		6,688,000	9,503,000
" 30	-	-	1,382,000		6,698,000	9,463,000
	40,576,000	40,606,000		30,447,000	154,950,000	266,579,000
October 1	-	-	1,395,000		6,030,000	8,820,000
" 2	-	-	1,353,000		5,480,000	8,187,000
" 3	-	-	1,357,000		6,372,000	9,082,000
" 4	-	-	1,384,000		6,501,000	9,271,000
" 5	-	-	1,196,000		6,439,000	8,846,000
" 6	-	-	1,392,000		6,524,000	9,311,000
" 7	-	-	1,406,000		6,779,000	9,591,000
" 8	-	-	1,411,000		6,418,000	9,240,000
" 9	-	-	1,411,000		6,829,000	9,661,000
" 10	-	-	1,414,000		6,857,000	9,686,000
" 11	-	-	1,408,000		6,881,000	9,698,000
" 12	-	-	1,418,000		6,862,000	9,698,000
" 13	-	-	1,395,000		7,059,000	9,851,000
" 14	-	-	1,399,000		7,106,000	9,905,000
" 15	-	-	1,396,000		7,148,000	9,941,000
" 16	-	-	1,410,000		7,363,000	10,183,000
" 17	-	-	1,338,000		7,293,000	10,005,000
" 18	-	-	1,400,000		7,342,000	10,139,000
" 19	-	-	1,399,000		7,323,000	10,129,000
" 20	-	-	1,395,000		7,328,000	10,118,000
" 21	-	-	1,386,000		7,323,000	10,097,000
" 22	-	-	1,383,000		7,327,000	10,096,000
" 23	-	-	1,385,000		7,336,000	10,106,000
" 24	-	-	1,388,000		7,340,000	10,116,000
" 25	-	-	1,359,000		7,367,000	10,087,000
" 26	-	-	1,395,000		7,330,000	10,119,000
" 27	-	-	1,403,000		5,069,000	7,876,000
" 28	-	-	1,400,000		7,120,000	9,921,000
" 29	-	-	1,394,000	580,000	6,441,000	9,809,000
" 30	-	-	1,408,000	921,000	6,601,000	10,342,000
" 31	-	-	1,400,000	1,072,000	6,782,000	10,655,000
	42,978,000	43,062,000		2,576,000	211,970,000	300,586,000

(2) STATEMENT showing QUANTITY of WATER PUMPED Day by Day from the RIVER TEES at the WORKS of the STOCKTON AND MIDDLESBROUGH WATER BOARD—*continued*.

Date.	Engines.					Total.
	No. 1.	No. 2.	No. 3.	No. 4.	No. 6.	
	Gallons.	Gallons.	Gallons.	Gallons.	Gallons.	Gallons.
November 1 - -	1,390,000	1,392,000			6,835,000	9,617,000
" 2 - -	1,395,000	1,397,000		538,000	6,770,000	10,100,000
" 3 - -	1,392,000	1,393,000		514,000	6,343,000	9,642,000
" 4 - -	1,401,000	1,401,000		1,028,000	6,610,000	10,440,000
" 5 - -	1,328,000	1,309,000		857,000	6,679,000	10,173,000
" 6 - -	1,396,000	1,397,000			6,702,000	9,495,000
" 7 - -	1,391,000	1,391,000			6,171,000	8,953,000
" 8 - -	1,408,000	1,411,000			6,518,000	9,337,000
" 9 - -	1,390,000	1,449,000			6,561,000	9,400,000
" 10 - -	1,385,000	1,332,000			5,230,000	7,947,000
" 11 - -	1,405,000	1,404,000			7,105,000	9,914,000
" 12 - -	1,382,000	1,382,000			6,657,000	9,421,000
" 13 - -	1,344,000	1,346,000			6,496,000	9,186,000
" 14 - -	1,398,000	1,399,000			6,756,000	9,553,000
" 15 - -	1,459,000	1,444,000	311,000		7,095,000	10,309,000
" 16 - -	1,424,000	1,444,000			7,010,000	9,878,000
" 17 - -	1,426,000	1,429,000			7,047,000	9,902,000
" 18 - -	1,174,000	1,193,000			7,041,000	9,408,000
" 19 - -	1,430,000	1,432,000			7,030,000	9,892,000
" 20 - -	1,413,000	1,415,000			7,029,000	9,857,000
" 21 - -	1,405,000	1,407,000			7,051,000	9,863,000
" 22 - -	1,373,000	1,237,000			6,738,000	9,348,000
" 23 - -	1,417,000	1,418,000			5,114,000	7,949,000
" 24 - -	1,412,000	1,412,000			7,013,000	9,837,000
" 25 - -	1,416,000	1,418,000			6,966,000	9,800,000
" 26 - -	1,408,000	1,409,000	55,000		6,949,000	9,821,000
" 27 - -	1,426,000	1,428,000	2,377,000	1,802,000	1,208,000	8,241,000
" 28 - -	1,423,000	1,424,000	580,000	479,000	5,733,000	9,639,000
" 29 - -	1,421,000	1,423,000		2,165,000	6,538,000	11,547,000
" 30 - -	1,294,000	1,331,000		2,094,000	6,809,000	11,528,000
	41,726,000	41,667,000	3,323,000	9,477,000	193,804,000	289,997,000
December 1 - -	1,402,000	1,404,000		1,952,000	5,390,000	10,158,000
" 2 - -	1,410,000	1,411,000			3,569,000	6,390,000
" 3 - -	1,413,000	1,414,000			6,706,000	9,533,000
" 4 - -	1,415,000	1,416,000			6,735,000	9,566,000
" 5 - -	1,414,000	1,415,000			6,848,000	9,677,000
" 6 - -	1,415,000	1,418,000			7,082,000	9,915,000
" 7 - -	1,420,000	1,420,000			6,984,000	9,824,000
" 8 - -	1,413,000	1,412,000			7,133,000	9,958,000
" 9 - -	1,420,000	1,421,000			7,284,000	10,125,000
" 10 - -	1,431,000	1,431,000			7,339,000	10,201,000
" 11 - -	1,425,000	1,426,000			7,357,000	10,208,000
" 12 - -	1,425,000	1,427,000			7,259,000	10,111,000
" 13 - -	1,424,000	1,425,000			7,242,000	10,091,000
" 14 - -	1,420,000	1,422,000			7,071,000	9,913,000
" 15 - -	1,430,000	1,430,000			7,094,000	9,954,000
" 16 - -	1,426,000	1,427,000			6,884,000	9,737,000
" 17 - -	1,423,000	1,424,000			6,776,000	9,623,000
" 18 - -	1,426,000	1,430,000			6,755,000	9,611,000
" 19 - -	1,425,000	1,426,000			6,662,000	9,513,000
" 20 - -	1,422,000	1,426,000			5,601,000	8,449,000
" 21 - -	1,419,000	1,419,000			5,706,000	8,544,000
" 22 - -	1,419,000	1,420,000			6,763,000	9,602,000
" 23 - -	1,423,000	1,426,000			7,239,000	10,088,000
" 24 - -	1,429,000	1,429,000			7,226,000	10,084,000
" 25 - -	1,417,000	1,420,000			6,881,000	9,718,000
" 26 - -	1,433,000	1,433,000			7,049,000	9,915,000
" 27 - -	1,441,000	1,444,000			7,140,000	10,025,000
" 28 - -	1,422,000	1,422,000			7,141,000	9,985,000
" 29 - -	1,386,000	1,443,000			7,121,000	9,950,000
" 30 - -	1,426,000	1,426,000			7,058,000	9,910,000
" 31 - -	1,426,000	1,427,000			7,027,000	9,870,000
	44,040,000	44,134,000		1,952,000	210,122,000	300,248,000

APPENDIX D.

TOPOGRAPHY OF THE RIVER TEES.

TOPOGRAPHICAL DESCRIPTION of the RIVER TEES from its SOURCE to the SEA. From "Water and Water Supply," by Professor Ansted, page 323.

The River Tees. Early Feeders.—The basin of the Tees has a drainage area of 744 square miles, and its south-eastern extremity is separated from the adjacent watersheds of the Esk and the Yorkshire Ouse by a very low watershed, little more than 200 feet above the sea. The Tees occupies a long narrow valley measuring about 55 miles in a direct line from its source to the sea, but its length, of course, is 88 miles, including the windings of the stream. Its sources are in the carboniferous limestone, but its early course is over millstone grit. In its lower course it crosses a considerable breadth of magnesium limestone and new red sandstone. The sources both of the Tees and the Tyne, which are within a very short distance of each other, are in the great mass of the upper carboniferous limestone attaining in Crossfell the height of 2,892 feet above the sea. The northern slopes of this mountain supply waters that feed both streams, whose early channel is separated by a lofty ridge that extends from the summit of Crossfell to the south-east for nearly four miles, rising into three successive peaks, each nearly 2,800 feet above the sea. The line of water-parting between the Tees and Tyne basins is irregular, and after continuing in an easterly direction for nearly five miles, runs along an exceedingly narrow and not lofty ridge which separates the two streams.

The recognised source of the Tees is called Tees Head, and is just under the eastern side of Crossfell, one of the loftiest and most lovely mountains of the Pennine Chain. From this source is flows due east about four miles through a narrow valley fed by torrents from the mountain side. It then receives two tributaries, Troutbeck from the right, and a smaller beck from the left. At this point are the workings of several old lead mines, and the river is bent aside from its course, turning south-east for five miles to a place where it makes a considerable leap into the valley below. Professor Phillips thus describes the early course of the river:—"Descending from Crossfell, and gathering small feeders on its way, the Tees expands into a long irregular surface called 'the Weel,' which is a deep mountain pool about $1\frac{1}{2}$ miles in length, and the overflow from this pool falls over a cliff of green stone 200 feet high in a wild and dreary cataract called 'Caldron Scout.'" Here it is joined by its first large tributary, called Maize Beck, which proceeds from the south-west and flows between Mickle Fell (2,590 feet) and Mertin Fell (2,206 feet). It is fed by several small torrents from both sides; flowing three miles further through a winding valley, Harwood Beck is reached. This stream rises about six miles to the north-west, and is supplied with water from a large number of torrents entering from each side between Herdship Fell and Three Pikes, both more than 2,000 feet above the sea. The bed of the Tees now widens, and the stream runs another mile over a shallow, stony bed till the High Force is reached, a celebrated waterfall where the river projects its waters over a huge rock of greenstone 69 feet high. This noble fall is usually in one sheet, but in times of flood it is divided. Below the fall the river runs over a rocky bed between cliffs of which that on the right side is greenstone and the left limestone. From the junction of Harwood Beck the main stream of the Tees takes the course of that tributary, and proceeds south-east for about eight miles to the confluence of the Lune, receiving only a few small feeders, till at Middleton, a mile above the Lune, a somewhat larger brook comes in from the north.

12. *The River Lune.*—The Lune is one of the larger tributaries of the Tees, and is entirely within the mountain limestone formation. It collects the waters that fall on the south side of Mickle Fell, and a range of fells of a horseshoe form, of which Mickle Fell forms the northern half. The rainfall from the hills collects in numerous channels, running various distances from two to four miles. Through this hollow, and converging at Lune Head House, where have been some old mines, the Lune is formed. The stream then runs for about three miles east through a rocky valley, and then turning north-east flows another three miles into the Tees. It receives on its way several small feeders from each side. The bed of the Lune, especially in its lower course, is irregularly covered with a thick deposit of boulder clay and sand.

A little below the confluence of the Lune the Eggleston Beck enters the Tees from the north through a rich and fertile valley.

13. *The River Balder.*—The Tees flows about five miles below the Lune junction through a country with a small population, but passing some villages, and is then joined by another affluent, the Balder. The sources of this river lie in a depression of the plateau north of Stanmore Common, and it runs altogether through the millstone grit. Two principal parallel becks, of which one is called Balder Beck, unite after about two miles, and then flow as the River Balder about eight miles to the Tees, receiving on their way a few small feeders. Balder Dale is a rocky and picturesque valley.

14. *The Deepdale Beck.*—From the Balder the Tees continues three miles to Barnard Castle, and near that town receives the Deepdale Beck. It is a small stream, but has a course of nearly ten miles from the eastern extremity of Stanmore Common, which is there between 1,500 and 1,600 feet above the sea.

15. *The River Greta*.—Three miles below the Deepdale the Greta joins the Tees, coming from the eastern and northern sides of Stanmore, and running through an open valley nearly due east seven miles to Bowes, and then curving round to the south flowing eight miles further in the same general direction till near the Tees, when it curves round to the north through Rokeby Park to its destination. It receives a few small feeders.

16. *The Alwent Beck*.—The Tees next winds round to the north for about six miles, passing a few small villages to a point where it receives the Alwent Beck from the left. This stream, rising in the hills that shut in the course of the Tyne between the confluence of the Lune and Balder, is called the Langley Beck in the upper part of its course. It flows almost in a straight line to the east for six miles into Raby Park, and through the park on its southern edge to the little town of Staindrop. It then flows south about three miles into the Tees. It is a very small stream. Below Staindrop it receives the name of Staindrop Beck. From the Staindrop, as far as Darlington, there are no tributaries of importance. The direct distance is little more than nine miles, but measured on the course of the stream, which winds considerably, it is very much more. Two or three small feeders enter the stream in this part of its course, which is through an open level country, the drainage of which passes eastwards and enters the Skerne. Other feeders from the north also enter the Skerne.

17. *The River Skerne*.—This river rises in the magnesium limestone of Durham, about five miles from the coast, and runs west and south-west, receiving small tributaries. After an irregular course of nearly 10 miles it approaches Sedgefield. It then turns round to the south, passing Aycliffe, and continues a very winding course to Darlington in the same direction. From Darlington it continues south to the Tees, which is about three miles distant.

18. *The Lower Tees*.—Below Croft, where the Skerne enters the Tees, the course of the river is exceedingly tortuous, much more than doubling its distance in the eight miles that intervene between Croft and Yarm. The only feeders that enter conveying any important addition to its waters are the Clow Beck, opposite the Skerne, and the Staindale Stoll coming from the east, a few miles below its confluence. Of these the Clow Beck requires notice from the great distance it travels, although under a curious succession of different names. It rises close to the Greta river, two or three miles from the confluence of that stream with the Tees. It flows first as Nov Beck, then as Hulton Beck, Caldwell Beck, and Aldborough Beck, till it terminates in Clow Beck, the whole distance being 15 miles in a direct line, though much more if measured on the windings of the stream. Its course is nearly east and parallel to the Tees, turning north to enter the river.

19. *River Leven*.—At Yarm the Tees is joined by the Leven river from the Cleveland district. It rises on the north side of Kildale Moor, close to the source of the Esk, and makes a small curve to the north along the northern part of the western slope of the Cleveland Hills, turning to Ayton to the south-west for a couple of miles. It there meets a branch called the Broughton Bridge Beck, which has had a direct course of nearly four miles east from the southern part of the western face of the same hills. The whole of this part of its source is highly picturesque, and less than a mile below the junction of the two streams the small River Tame comes in from the north. The stream now flows in a very winding course for five miles (not including the windings), and then turns north and north-west for another four miles to the Tees. The scenery of the whole of the upper part of the stream is singularly beautiful, and in its lower part, after receiving a small feeder at Rudby, it flows peacefully through a rich and well-wooded vale.

20. *Billingham Beck*.—From Yarm the Tees flows as a large and important stream by Stockton and Middlesbrough into a wide estuary by which it opens to the German Ocean. Below Stockton it receives the collected drainage of a considerable tract of low, flat lands to the north and west by the Billingham Beck, and of another similar tract to the south by the Stainsby Beck. Below Middlesbrough the North Burn and Greatham Beck convey a certain extent of northern drainage into the estuary of the Tees. The general character of the Tees is that of a broad, shallow stream, flowing rapidly, and subject to frequent inundation.

APPENDIX E.(1).

RAINFALL AND METEOROLOGICAL RETURNS IN THE TEES VALLEY IN 1890.

REGISTER OF RAINFALL IN 1890.
Kept at Mickleton in the County of York.

Date.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Date.
1	—	·11	—	—	—	·02	·28	·35	·07	·05	·25	—	1
2	—	—	—	—	—	·17	·15	·01	·04	—	·03	·04	2
3	·11	—	—	—	—	—	·14	—	·13	·07	·07	·16	3
4	·20	—	·17	—	—	·01	·02	—	·03	·04	—	·15	4
5	·06	—	—	·09	·05	—	·02	—	—	·17	—	·11	5
6	·32	—	—	—	·04	·08	—	·01	—	·44	·32	·02	6
7	—	·03	·27	·07	·36	—	·07	—	—	—	—	—	7
8	·01	—	20	—	—	·15	—	—	—	—	1·05	—	8
9	·72	—	·15	—	·14	—	—	—	—	·15	·05	—	9
10	·19	—	·05	—	·05	·47	·19	·56	—	—	·17	—	10
11	·09	—	·20	—	·04	·21	·05	·79	—	—	·13	—	11
12	·04	—	—	—	·22	·10	·04	·97	—	—	·07	—	12
13	—	—	·08	·07	·02	—	·04	·31	—	—	·02	—	13
14	·16	·04	—	—	—	—	—	·02	—	·12	·03	—	14
15	—	·46	—	—	—	—	—	21	—	·20	—	—	15
16	—	·03	·11	·11	·57	·11	·33	·01	—	·02	·02	·06	16
17	·14	—	—	—	—	—	·04	·20	·10	—	·06	—	17
18	·28	—	·02	·03	·10	·09	—	—	·13	—	—	—	18
19	·12	—	·12	—	·13	—	—	—	·18	—	·01	—	19
20	·09	—	·25	—	·01	—	·08	·02	·05	·06	·06	—	20
21	·11	·09	—	·18	—	·01	·01	·27	·02	·11	·07	—	21
22	—	—	·03	·29	—	—	—	·98	—	—	·45	—	22
23	—	—	·37	—	—	—	—	·01	·08	—	·40	·11	23
24	·62	·13	·39	·02	—	·07	—	·05	·02	·03	—	—	24
25	·18	—	·02	·26	—	—	—	·35	·07	·15	·11	·10	25
26	·48	—	·04	·10	—	—	·17	·21	—	·05	—	·06	26
27	—	·02	·14	·02	—	·11	·02	·25	·09	—	—	—	27
28	·08	·02	·07	—	—	·05	—	·03	—	·15	—	—	28
29	·05	—	·03	·07	·25	—	·05	·02	·16	·21	·16	—	29
30	—	—	—	—	—	1·24	·17	—	·64	·03	·20	—	30
31	—	—	—	—	—	—	—	—	—	·02	—	·02	31
Totals -	4·05	0·83	2·71	1·31	1·92	2·89	1·87	5·63	1·81	2·07	3·73	0·83	Totals.

APPENDIX E.(2).

REGISTER OF RAINFALL IN 1890.
Kept at Barnard Castle in the County of Durham.

Date.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Date.
1	—	·070	·070(S)	—	—	—	·225	·600	·070	·060	·330	—	1
2	—	—	·070(S)	—	—	·010	·075	—	·015	—	·020	·020	2
3	·065	—	—	—	—	—	·180	·005	·180	—	·015	·210	3
4	·425	—	·015	—	—	—	·050	—	·015	—	—	·165	4
5	·320	—	—	—	·040	·070	·025	—	—	·025	·010	·060	5
6	·110	—	·015	·050	·020	·110	—	—	—	·250	·555	·015	6
7	·045	—	·075	·045	·300	—	·035	—	—	·215	·040	—	7
8	·040	·010(S)	·185	—	—	·085	·010	·010	—	—	1·000	·005	8
9	·360	—	·015	·035(S)	·280	—	—	—	—	—	·040	·020(S)	9
10	·110	—	·020	—	·190	·500	·090	·910	—	—	·125	—	10
11	·040	—	—	—	·220	·705	·135	·755	—	—	·085	—	11
12	·010	—	—	·085(S)	·015	·165	·020	·850	—	—	·125	—	12
13	—	·010(S)	—	·080(S)	—	—	—	·060	—	—	—	—	13
14	·130	·025	—	—	·050	—	—	·065	—	·190	·040	—	14
15	—	·705(S)	—	—	·015	—	—	·265	—	·130	—	·125(S)	15
16	—	·045	·045	·180	·515	·070	·520	·035	—	·015	·010	·005(S)	16
17	·170	—	—	·045	—	—	·080	—	·080	—	·005	—	17
18	·290	—	·030	·020	·045	·100	·180	·005	·060	—	—	—	18
19	·025	—	·090	—	·130	—	—	—	·200	·005	·025	—	19
20	·065(S)	·140(S)	·250(S)	—	—	·010	·050	—	·270	·170	—	—	20
21	·225	—	—	·035	—	—	—	·095	·030	·060	·800	—	21
22	290(S)	—	·020	·335	—	·010	—	·620	—	·005	·210	·040(S)	22
23	·115(S)	·020	·465	—	—	—	·065	—	·075	—	·595	·080(S)	23
24	·290	·010	·440	·020	—	—	·015	·060	—	—	·070(S)	—	24
25	060	—	·010	·195	—	—	·040	·240	—	·210	·130(S)	·080	25
26	260	·030	·045	·085	—	·015	·025	·090	—	·080(S)	·510(S)	·120(S)	26
27	—	—	·065	—	—	·065	·005	·150	—	—	·220(S)	·260(S)	27
28	·085	·030(S)	·060	—	—	·265	—	·050	—	·055	·080(S)	·050(S)	28
29	—	—	·025	·125	·180	—	·025	·185	·130	·050	—	—	29
30	·095	—	—	—	·035	·960	·015	—	·170	·010	·045	·015(S)	30
31	—	—	—	—	—	—	—	—	—	—	—	—	31
Totals -	3·625	1·095	2·010	1·335	2·035	3·140	1·865	5·050	1·295	1·530	5·080	1·270	Totals.

APPENDIX E.(3).

REGISTER OF RAINFALL IN 1890.

Kept at Whorlton near Barnard Castle.

Datc.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Date.
1	—	·06	—	—	—	—	·15	·57	·11	·04	—	—	1
2	—	—	—	—	—	—	—	—	·04	—	·29	—	2
3	—	—	—	—	—	—	·39	·06	·19	—	·01	·21	3
4	·38	—	·12	—	—	—	·13	—	·01	—	—	·14	4
5	·28	—	—	—	·06	·08	—	—	—	—	—	·05	5
6	·08	—	—	—	—	—	—	—	—	—	·40	—	6
7	—	—	·01	·07	·34	·09	·05	—	—	·46	·02	—	7
8	·02	—	·13	—	—	·08	—	—	—	—	·93	·05	8
9	·28	—	—	—	·33	—	—	—	—	—	·03	—	9
10	·12	—	·01	—	·06	·65	·09	·98	—	—	·15	—	10
11	·04	—	—	—	·27	·40	·08	·39	—	—	·03	—	11
12	—	—	—	—	·05	·24	·03	·79	—	—	·10	—	12
13	·10	—	—	·21	—	—	—	·67	—	—	·03	—	13
14	—	—	—	—	·05	—	—	·02	—	·18	·04	—	14
15	—	·92	—	—	·06	—	—	·25	—	·12	—	·17	15
16	—	·02	·24	·20	·49	·08	·87	—	—	—	—	—	16
17	·10	—	—	·07	·01	—	·10	—	·09	—	—	—	17
18	·05	—	—	·04	·05	·14	·19	—	·15	—	—	—	18
19	·13	—	·14	—	·12	—	—	—	·24	—	·03	—	19
20	·05	·12(S)	·24	—	—	—	·04	—	·08	·31	—	—	20
21	·15	—	—	·14	—	—	—	·10	·08	·06	·05	—	21
22	—	—	—	·10	—	—	—	·55	—	—	·06	—	22
23	—	·04	·53	·01	—	—	—	—	·05	—	·65	—	23
24	·72	—	·44	·03	—	—	—	·07	—	—	·10	—	24
25	—	—	—	·13	—	—	—	·20	—	—	—	—	25
26	·19	—	·04	·07	—	—	·10	·12	—	—	—	·41	26
27	—	—	·08	—	—	·10	—	·17	—	·32	—	—	27
28	·10	·05	·04	—	—	·07	—	·04	—	·04	—	—	28
29	—	—	—	·16	·15	·05	—	·04	·12	—	—	—	29
30	·10	—	—	—	—	·83	·04	—	·12	·01	·62(S)	—	30
31	—	—	—	—	—	—	—	—	—	—	—	·29	31
Totals -	2·89	1·21	2·02	1·23	2·04	2·81	2·26	4·42	1·28	1·54	3·54	1·32	Totals

APPENDIX E.(4).

REGISTER OF RAINFALL IN 1890.

Kept at Raby Castle, Staindrop, in the County of Durham.

Date.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Date.
1	—	·03	—	·06	—	·10	—	—	·05	·12	—	—	1
2	—	—	—	—	·10	—	—	·40	—	·07	·30	—	2
3	·05	—	—	—	·24	—	·16	—	·23	—	—	·03	3
4	·09	—	—	·15	—	·20	—	—	·15	—	—	·30	4
5	—	·10	—	—	—	—	·04	·23	—	—	·26	·15	5
6	—	—	·30	—	·18	—	·09	—	·40	—	—	·06	6
7	—	—	·25	·09	—	—	—	—	—	·42	·40	·04	7
8	—	—	—	—	—	1·05	—	—	—	·15	·05	—	8
9	—	—	—	—	—	—	—	1·24	—	—	·81	—	9
10	—	—	—	—	—	—	·72	·65	—	—	·18	—	10
11	·16	—	·05	—	—	·64	—	·86	·05	—	·20	—	11
12	—	—	—	—	·56	·12	—	—	·16	—	·10	—	12
13	—	—	—	—	—	—	—	—	—	—	·11	—	13
14	—	—	—	—	—	—	—	—	—	—	—	—	14
15	·25	—	—	·20	·30	—	—	·49	—	—	—	—	15
16	·03	·05	—	·05	·08	·84	—	·20	—	—	—	—	16
17	—	—	—	—	—	—	—	·05	—	—	—	—	17
18	—	—	—	—	·19	—	—	—	—	—	—	—	18
19	—	—	·04	—	·40	—	—	—	—	—	—	—	19
20	—	—	—	·08	—	·12	—	—	·30	·18	·07	—	20
21	—	—	—	—	—	—	—	—	—	·10	—	—	21
22	—	—	—	—	—	—	—	·60	—	—	·05	—	22
23	—	—	—	—	—	—	—	—	—	—	—	—	23
24	·40	—	—	·16	·16	—	·63	·09	·10	—	·72	·23	24
25	—	·23	—	·03	—	—	·18	—	—	—	·11	—	25
26	—	·09	—	—	·08	—	—	·56	—	—	—	—	26
27	—	—	—	—	—	—	—	—	—	·42	·25	·21	27
28	—	—	—	·09	—	·05	—	—	—	—	·90	—	28
29	·13	—	—	—	·05	·04	·43	·23	—	—	—	—	29
30	—	—	·16	—	—	—	—	—	·16	—	—	—	30
31	—	—	—	—	—	—	—	·10	—	·10	—	—	31
Totals -	1·11	0·50	0·80	0·91	2·34	3·16	2·21	5·70	1·60	1·57	4·51	1·02	Totals

APPENDIX E.(5).

REGISTER OF RAINFALL IN 1890.

Kept at Southend, Darlington, in the County of Durham.

Date.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Date.
1	—	·03	·05(S)	—	—	—	·17	·27	·14	·06	·39	·01	1
2	—	—	·04(S)	—	—	·01	·40	—	·30	—	—	—	2
3	·02	—	—	—	—	—	·26	·04	·32	—	—	·21	3
4	·12	—	—	—	·01	—	·01	—	—	—	—	·12	4
5	·03	—	—	—	·06	·19	—	—	—	·01	·07	·03	5
6	·05	·05	—	·02	·02	·04	—	—	—	·21	·42	·02	6
7	·03	—	—	·11	·49	—	·01	—	—	·17	·10	—	7
8	—	—	—	—	·01	·09	—	·03	—	—	·43	·03	8
9	·21	—	—	·02	·15	—	·01	—	—	—	·03	—	9
10	·13	—	—	—	·07	·28	—	·88	—	—	·05	·01	10
11	·07	—	—	—	·27	·19	—	·17	—	—	·06	—	11
12	—	—	—	·04(S)	·08	·09	·07	1·25	—	—	·10	—	12
13	—	—	—	·09	—	—	—	·10	—	—	·01	—	13
14	·04	·02	·09	—	—	—	—	·05	·01	·06	·04	—	14
15	—	·76	—	—	·11	—	—	·10	—	—	—	·09	15
16	—	·01	·24	·02	·40	·07	·45	·01	—	—	·02	—	16
17	·13	—	—	·04	—	—	·09	—	·09	—	·01	—	17
18	·08	—	·02	·02	·02	·18	·21	—	·09	—	—	—	18
19	—	—	·12	—	·07	—	—	—	·39	·03	·02	—	19
20	—	·13	·24	—	—	—	·02	—	—	·17	—	—	20
21	·24	·02	—	·04	—	—	—	·12	·50	·05	—	—	21
22	·20	—	·04	·06	—	—	—	·53	·02	—	—	·02(S)	22
23	·28	·02	·40	·02	—	—	·10	—	·05	—	·78	·16(S)	23
24	·17	—	·26	—	—	—	—	·09	—	—	·10	—	24
25	—	·02	·02	·23	—	—	·01	·34	—	·19	·09(S)	·31	25
26	·10	—	·01	·09	—	·02	·05	·05	—	·32(S)	·41(S)	·26	26
27	—	·04(S)	·08	—	—	·05	—	·13	—	—	·20(S)	·10	27
28	·10	·03(S)	·09	—	—	·27	—	·23	—	·06	·20(S)	·03(S)	28
29	·02	—	—	·15	·25	—	·06	·02	·14	—	—	—	29
30	·19	—	—	—	·07	·84	—	—	·04	·06	·08	—	30
31	—	—	—	—	—	—	—	—	—	—	—	—	31
Totals -	2·21	1·13	1·70	0·95	2·08	2·32	2·01	4·41	2·09	1·39	3·61	1·40	Totals

APPENDIX E.(6).

REGISTER OF RAINFALL IN 1890.

Kept at the Albert Park, Middlesbrough, in the County of York.

Date.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Date.
1	—	·02	·01	—	—	—	·06	·54	·05	·04	·24	·01	1
2	—	—	·03	—	—	—	·30	·63	·38	—	·03	—	2
3	—	—	—	—	—	—	·32	—	·17	—	—	·09	3
4	·06	·08	·01	—	—	—	—	—	·03	—	—	·13	4
5	·02	—	—	—	·07	·13	·02	·03	—	—	·06	·08	5
6	·02	·02	—	·06	·01	·06	—	—	—	·31	·23	·04	6
7	·02	—	—	·03	·38	—	·04	—	—	·17	·52	·03	7
8	—	—	·09	—	·04	·08	·02	·02	—	—	·07	—	8
9	·16	—	—	·04	·08	·33	—	—	—	—	·04	—	9
10	·05	—	—	—	·19	—	—	·37	—	—	·01	—	10
11	·06	—	—	·01	·42	·24	—	—	—	—	·03	—	11
12	—	—	—	·05	·09	—	·06	2·20	—	—	·04	—	12
13	—	—	—	·08	—	—	—	·21	—	—	—	—	13
14	·03	·09	—	—	—	—	—	·03	—	·02	—	·02	14
15	—	·48	—	—	·16	—	—	·15	—	—	—	·19	15
16	—	—	—	·01	·23	·11	—	·12	—	·06	—	·01	16
17	·02	—	·03	·02	·36	—	·10	—	·24	—	·04	—	17
18	·11	—	·01	·02	·08	·18	·11	—	·03	—	—	—	18
19	·01	—	·33	·01	·02	—	—	·01	·09	·03	·03	—	19
20	—	12	·24	—	—	—	—	—	—	·30	—	—	20
21	·14	—	—	—	—	·09	—	·18	·28	·02	·03	—	21
22	·07	—	·01	·06	—	—	—	·49	·01	—	—	—	22
23	·32	·03	·24	—	—	—	·10	·04	·04	—	·90	·14	23
24	·06	·01	·07	·13	—	—	—	·25	·03	—	·25	—	24
25	·03	·07	·01	·06	—	—	—	·32	·12	·06	·95	·43	25
26	·06	·04	—	—	·02	·13	·05	·36	—	·50	·25	·14	26
27	—	·12	·12	—	—	·05	—	·15	—	—	·11	·11	27
28	·18	·12	·07	—	—	·13	—	·07	—	·38	·15	·02	28
29	·09	—	—	·08	·46	·03	·04	·13	·17	·04	—	—	29
30	·17	—	—	—	·13	·50	—	—	·13	—	·05	—	30
31	—	—	—	—	—	—	—	—	—	·02	—	—	31
Totals -	1·68	1·20	1·27	0·66	2·74	2·06	1·22	6·30	1·77	1·95	3·13	1·44	Totals

METEOROLOGICAL REGISTER AT ALBERT PARK.

July 1890.

Date.	9 a.m.				9 p.m.				In the Day.	
	Barometer.	Dry Bulb.	Wet Bulb.	Wind Direction.	Barometer.	Dry Bulb.	Wet Bulb.	Wind Direction.	Max.	Min.
July 1	In.	53	52	E.	In.	53	52	N.E.	59	47
" 2	29.30	54	51	N.W.	29.40	53	52	S.W.	62	48
" 3	29.60	57	52	S.W.	29.60	50	49	W.	59	42
" 4	29.60	56	52	W.	29.60	49	48	N.E.	63	43
" 5	29.60	54	50	N.	29.60	52	48	N.	60	46
" 6	29.70	53	48	N.	29.70	52	48	N.W.	60	50
" 7	29.70	54	50	N.W.	29.50	52	51	S.W.	62	46
" 8	29.20	59	57	S.W.	29.50	52	48	S.W.	62	52
" 9	29.50	57	52	S.W.	28.60	55	51	S.W.	65	50
" 10	29.80	55	49	N.W.	29.80	51	42	N.E.	65	46
" 11	29.80	51	49	N.	29.80	44	43	N.W.	57	46
" 12	29.70	55	49	N.W.	29.60	55	51	S.W.	64	41
" 13	29.50	64	60	S.W.	29.50	64	60	S.	71	51
" 14	29.40	64	60	S.W.	29.70	55	52	S.W.	62	59
" 15	29.70	63	56	S.W.	29.90	54	52	S.W.	69	51
" 16	30.	60	56	S.	30.	57	55	N.E.	67	41
" 17	29.90	58	55	N.E.	29.80	54	52	N.E.	53	56
" 18	29.70	56	53	N.W.	29.70	54	52	N.E.	62	52
" 19	29.90	58	55	N.E.	30.	57	54	N.	65	51
" 20	30.	60	57	N.W.	30.	57	52	N.W.	67	52
" 21	30.	67	62	S.W.	29.90	61	60	S.W.	73	45
" 22	29.90	62	55	W.	29.90	51	51	S.W.	67	57
" 23	29.90	63	59	W.	29.90	55	51	W.	72	55
" 24	29.80	61	56	N.W.	29.80	54	53	S.W.	62	50
" 25	29.90	58	54	W.	29.90	54	53	S.W.	65	50
" 26	29.90	64	61	S.W.	29.80	56	52	S.W.	70	48
" 27	29.70	65	61	S.W.	29.70	57	54	S.W.	70	49
" 28	29.60	64	55	S.W.	29.70	57	54	S.W.	63	51
" 29	29.80	59	54	S.W.	29.70	55	53	S.W.	63	50
" 30	29.60	60	55	S.W.	29.60	63	60	S.W.	70	58
" 31	29.60	65	60	S.W.	29.70	55	57	S.W.	75	54
Totals	920.90	1829	1695	—	921.50	1688	1619	—	2004	1537
Means	29.71	—	—	—	29.71	—	—	—	66	49

August 1890.

Date.	9 a.m.				9 p.m.				In the Day.	
	Barometer.	Dry Bulb.	Wet Bulb.	Wind Direction.	Barometer.	Dry Bulb.	Wet Bulb.	Wind Direction.	Max.	Min.
Aug. 1	In.	61	58	S.	In.	56	55	N.E.	63	55
" 2	29.70	58	56	N.	29.90	58	56	N.E.	63	55
" 3	30.	64	59	S.W.	30.	61	58	S.W.	74	50
" 4	30.	64	62	S.W.	30.	61	55	S.W.	75	55
" 5	30.10	70	65	W.	30.10	58	56	S.W.	73	54
" 6	30.	60	58	N.	30.	57	55	N.E.	66	54
" 7	30.10	62	58	S.E.	30.10	57	54	E.	62	55
" 8	30.10	60	57	N.	30.10	58	56	E.	62	47
" 9	30.10	58	56	E.	30.	58	56	E.	65	55
" 10	29.90	65	62	N.E.	29.60	57	57	N.E.	66	58
" 11	29.50	62	60	W.	29.60	60	59	E.	71	56
" 12	29.60	59	58	N.	29.60	56	55	N.W.	65	56
" 13	29.40	54	54	N.	29.40	54	53	N.	60	50
" 14	29.50	53	53	S.	29.50	54	52	S.W.	67	50
" 15	29.20	61	58	S.W.	29.40	54	51	S.W.	64	54
" 16	29.40	55	53	S.W.	29.50	54	50	S.W.	63	48
" 17	29.60	60	56	S.W.	29.70	56	54	S.W.	68	48
" 18	29.70	58	55	S.W.	29.80	57	55	S.W.	65	47
" 19	29.80	60	57	N.E.	29.80	55	54	S.	64	48
" 20	29.70	62	57	S.	29.70	53	52	S.W.	65	46
" 21	29.70	61	59	S.W.	29.70	58	51	S.W.	63	51
" 22	29.70	58	53	S.W.	29.70	54	52	S.W.	62	45
" 23	29.40	54	50	N.W.	29.40	54	50	W.	60	50
" 24	29.50	55	50	W.	29.50	50	49	W.	64	40
" 25	29.40	56	53	W.	29.30	50	50	S.W.	65	43
" 26	29.10	56	52	W.	29.10	48	46	S.W.	59	45
" 27	29.10	57	53	S.W.	29.30	48	48	N.	63	41
" 28	29.50	53	51	N.	29.70	49	48	S.	59	43
" 29	29.80	52	47	N.W.	29.80	50	48	N.	58	41
" 30	29.90	52	49	N.	30.	48	44	N.	55	45
" 31	30.10	53	49	N.	30.10	44	44	S.E.	57	38
Totals	920.40	1813	1718	—	921.10	1687	1623	—	1986	1523
Means	29.75 29.70	—	—	—	29.75	—	—	—	64	49

Meteorological Register at Albert Park—*continued.*

September 1890.

Date.	9 a.m.				9 p.m.				In the Day.	
	Barometer.	Dry Bulb.	Wet Bulb.	Wind Direction.	Barometer.	Dry Bulb.	Wet Bulb.	Wind Direction.	Max.	Min.
Sept. 1	Ins. 30·10	54	50	S.E.	Ins. 30·10	53	51	S.	64	35
" 2	30·	61	58	S.	30·	58	57	S.	69	53
" 3	30·	61	60	S.	30·	60	59	S.	70	57
" 4	30·10	60	60	S.	30·20	61	60	S.	69	58
" 5	30·20	58	57	S.	30·20	58	57	N.W.	71	57
" 6	30·30	64	61	N.W.	30·30	58	57	S.	67	55
" 7	30·30	62	59	S.W.	30·30	60	59	S.W.	75	46
" 8	30·30	62	59	S.W.	30·20	57	55	S.W.	77	50
" 9	30·10	64	61	S.W.	30·20	58	57	S.W.	70	53
" 10	30·10	56	54	S.W.	30·	53	51	S.W.	64	53
" 11	29·90	60	57	S.W.	30·10	56	55	S.W.	67	52
" 12	30·10	58	55	S.W.	30·10	55	55	S.W.	63	43
" 13	30·10	57	55	S.W.	30·10	56	56	S.W.	70	44
" 14	30·10	55	55	S.W.	30·10	57	56	E.	70	47
" 15	30·	62	60	S.W.	29·90	60	58	N.E.	72	48
" 16	29·90	65	63	S.W.	29·90	57	56	E.	75	53
" 17	29·80	62	60	S.W.	29·80	58	57	S.E.	71	54
" 18	29·70	60	60	S.	29·80	56	56	N.E.	69	57
" 19	29·80	59	57	S.W.	29·70	56	55	S.	68	52
" 20	29·50	60	59	S.	29·50	56	55	S.W.	67	54
" 21	29·50	59	57	S.	29·50	52	52	S.	64	52
" 22	29·40	58	56	S.W.	29·60	53	53	S.W.	65	52
" 23	29·70	55	54	S.W.	29·80	54	52	S.W.	67	45
" 24	29·90	60	57	S.W.	30·	49	47	S.W.	65	50
" 25	30·20	55	50	S.W.	30·20	56	54	S.W.	62	42
" 26	30·10	62	60	S.W.	30·10	60	59	S.	68	51
" 27	30·20	64	61	S.	30·10	60	59	S.W.	70	59
" 28	30·	59	58	S.W.	29·90	56	55	S.	65	54
" 29	29·80	58	56	S.	29·60	57	56	S.W.	66	47
" 30	29·60	55	54	S.W.	29·60	56	55	S.W.	61	53
Totals	898·80	1785	1723	—	898·90	1696	1664	—	2041	1532
Means	29·96	—	—	—	29·96	—	—	—	68	51

October 1890.

Date.	9 a.m.				9 p.m.				In the Day.	
	Barometer.	Dry Bulb.	Wet Bulb.	Wind Direction.	Barometer.	Dry Bulb.	Wet Bulb.	Wind Direction.	Max.	Min.
Oct. 1	Ins. 29·30	60	57	S.W.	Ins. 29·70	45	42	N.	62	54
" 2	30·10	47	44	N.	30·10	49	46	S.W.	55	35
" 3	29·90	56	53	S.W.	29·90	59	56	S.W.	61	47
" 4	29·90	63	60	S.W.	29·90	59	56	S.W.	66	55
" 5	29·90	63	59	S.W.	29·80	59	56	S.W.	66	56
" 6	29·80	54	53	W.	29·80	52	50	S.W.	62	54
" 7	29·80	47	47	E.	29·90	50	50	N.E.	54	47
" 8	30·30	49	47	N.W.	30·40	40	40	S.W.	56	42
" 9	30·20	48	46	S.W.	30·20	46	46	S.W.	60	36
" 10	30·10	60	57	S.	30·10	50	49	S.W.	66	46
" 11	30·10	57	55	S.W.	30·10	50	48	S.W.	62	49
" 12	30·20	57	55	S.W.	30·20	46	45	S.W.	68	48
" 13	30·20	53	51	S.W.	30·10	47	47	S.W.	68	38
" 14	30·	56	54	S.W.	29·80	52	51	S.W.	61	45
" 15	29·40	51	49	W.	29·30	40	40	W.	55	48
" 16	29·30	47	45	W.	29·40	41	41	W.	51	37
" 17	29·60	45	43	W.	29·70	45	45	N.W.	55	39
" 18	29·90	48	47	N.	30·	46	44	N.	52	44
" 19	30·10	46	43	N.	30·10	48	45	N.	49	44
" 20	30·10	44	44	S.	30·10	46	46	S.W.	48	43
" 21	30·20	47	47	S.W.	30·20	47	47	S.	50	44
" 22	30·30	48	48	S.	30·	51	50	S.	55	45
" 23	30·30	52	51	S.	30·10	50	49	S.W.	57	50
" 24	29·90	54	53	S.W.	29·70	53	52	S.W.	58	45
" 25	29·50	46	45	S.W.	29·40	38	38	N.	50	44
" 26	29·20	34	34	N.	29·40	36	36	N.W.	43	32
" 27	29·70	36	36	N.W.	29·80	32	31	N.W.	41	32
" 28	29·80	31	30	N.W.	29·70	50	49	S.W.	52	24
" 29	29·70	53	52	S.W.	29·50	53	52	S.W.	56	41
" 30	29·80	39	39	N.W.	29·70	40	40	S.	54	34
" 31	29·40	52	52	S.	29·30	50	49	N.	58	38
Totals	926·00	1543	1596	—	925·40	1470	1436	—	1751	1537
Means	29·86	—	—	—	29·86	—	—	—	56	49

APPENDIX F.

RECORDS OF FLOODS IN THE RIVER TEES, 1890.

(1) ABSTRACT of OBSERVATIONS made in 1890 as to the State of the RIVER TEES at BLACKWELL by Inspector MABON on behalf of the TEES SALMON FISHERY BOARD.

1890.			1890.		
January	5	-	September 23	-	River in flood.
"	25	-	October 30	-	" " two feet.
April	17	-	November 1	-	" " " "
June	11	-	" 2	-	" " seven "
July	1	-	" 7	-	" " four "
"	31	-	" 9	-	" " ten "
August	12	-	" 14	-	" " four "
"	13	-	December 1	-	" " eight "
"	23	-	" 5	-	" " three "
September	3	-			

(2) ABSTRACT of OBSERVATIONS made in 1890 as to the State of the RIVER TEES at MIDDLETON ONE ROW by Inspector BRUNSKILL on behalf of the TEES SALMON FISHERY BOARD.

1890.			1890.				
January	6	-	Flood in the river.	August	26	-	Fresh water in the river.
"	7	-	"	"	27	-	"
"	8	-	"	September	3	-	"
"	10	-	Heavy flood in the river.	"	4	-	"
"	11	-	Flood in the river.	"	26	-	"
"	13	-	"	October	1	-	Heavy flood in the river.
"	18	-	"	"	2	-	Fresh water in the river.
"	19	-	"	"	7	-	Flood.
"	25	-	Great flood.	"	8	-	Fresh water in the river.
"	26	-	Flood.	"	9	-	"
"	27	-	Fresh water in the river.	"	16	-	"
"	30	-	Flood.	"	17	-	"
February	16	-	Fresh water in the river.	"	29	-	"
"	25	-	"	"	30	-	"
March	6	-	"	November	3	-	"
"	7	-	"	"	7	-	Flood.
"	24	-	"	"	9	-	"
"	25	-	Flood in the river.	"	10	-	Fresh water in the river.
"	28	-	Fresh water in the river.	"	11	-	"
April	23	-	"	"	12	-	"
May	17	-	Heavy flood in the river.	"	13	-	Flood.
"	18	-	Fresh water in the river.	"	14	-	Fresh water in the river.
June	6	-	"	"	15	-	Flood.
"	11	-	"	"	16	-	Fresh water in the river.
"	12	-	"	"	23	-	Flood.
"	13	-	"	"	24	-	"
"	17	-	"	"	25	-	"
July	1	-	"	"	26	-	Fresh water in the river.
"	2	-	"	December	1	-	Flood.
"	3	-	Flood in the river.	"	2	-	"
"	4	-	Fresh water in the river.	"	3	-	Fresh water in the river.
"	5	-	"	"	4	-	Flood.
"	24	-	"	"	5	-	Fresh water in the river.
"	27	-	"	"	6	-	"
August	12	-	Flood.	"	26	-	"
"	13	-	Heavy flood in the river.	"	27	-	"
"	14	-	Flood.	"	28	-	"
"	23	-	Heavy flood in the river.	"	29	-	"
"	25	-	Fresh water in the river.				

APPENDIX G.

REPORTS OF ANALYSES OF TEES WATER MADE IN 1890-91.

(1.) REPORT by MR. W. F. K. STOCK on CHEMICAL ANALYSIS of WATER taken from (a) the RIVER TEES at the INTAKE of the DARLINGTON WATERWORKS and (b) a TAP in the TOWN of DARLINGTON in NOVEMBER 1890.

County Analyst's Office, Darlington,
December 2, 1890.

SIR,

I BEG to inform you that in accordance with the instructions received from you on the 15th November on behalf of the Corporation of Darlington, I have analysed two samples of Tees water which I will call sample A and sample B respectively.

These samples were collected by myself and furnished the following results:—

	SAMPLE A. Unfiltered direct from the River.	SAMPLE B. Collected from Tap, 87, Stanhope Road.
Colour and appearance in two foot tube -	Greenish brown, not clear.	Greenish yellow, clear and bright.
Smell when heated to 100° F. -	Peaty - - -	Faint earthy.
Nitrogen as nitrates - - -	·0280 - - -	·0280 grains per gallon.
Chlorine as chlorides - - -	·7000 - - -	·7000 " "
Ammonia - - -	·0007 - - -	·0003 " "
Albuminoid ammonia - - -	Trace - - -	·0028 " "
Oxygen absorption at 80° F. in 15 minutes -	·1498 - - -	·1270 " "
Oxygen absorption at 80° F. in 4 hours -	·2455 - - -	·2105 " "
Total solid matter dried at 220° F. -	11·0000 - - -	10·5000 " "
Results of special microscopical examination at from 60 to 800 diameters.	Many moving organisms including bacteria, domestic fibres, &c., &c. Sand and clay.	Almost total disappearance of bacterial life. Objectionable solid matters absent.

Sample A. was taken from the river direct on the 28th ultimo at 3.30 p.m. It was drawn at a point about 60 yards above the No. 1 intake of the Darlington Corporation's Waterworks. The river was running at, as nearly as could be judged, normal winter flow. There was no flood water coming down.

Sample B was collected at a private tap on Stanhope Road South at 1 p.m. on the 29th ultimo; nearly 24 hours had thus elapsed between the collection of the two samples, this interval being allowed in order that there should be no doubt about the water pumped on the 28th having reached the town mains.

It will probably be most convenient for me to give my own interpretation of the results of my analyses without any reference to previous examinations.

With regard to sample A. This sample shows that Tees water, as it arrives on a normal winter flow, at the No. 1 intake of the Darlington Corporation's Waterworks, cannot be regarded as a pure and wholesome drinking water. It contains matters which are distinctly traceable to animal excreta. It does not follow that these matters are directly traceable to any special locality, for it must be remembered that a considerable part of the water reaching the lower run of the Tees comes from pasture lands and tillage over which a large amount of excretal matter is necessarily spread. This part of what may be called the sewage pollution of the Tees, and it is a very distinct part, must be looked upon as unavoidable contamination.

But beyond these sewage matters, which I am clearly separating in my own mind from the soluble matters derived from the peaty upper reaches of the river, the sample marked A contains half a grain per gallon of suspended matter, matter which does not subside entirely when the water is left in perfect quiet for 72 hours, and in these suspended matters careful microscopical research reveals the presence of matters of undoubtedly domestic origin. They consist of broken human hairs, paper fibre, dyed cotton, and woollen fibres, and the like. To my mind the presence of such matters in drinking water would constitute one of the most serious objections to its use, for it would be easy to imagine circumstances under which, owing to their accompaniments, such matters might give rise to serious consequences. It is not now essential to deal with the local origin of these impurities. It is sufficient that they unquestionably exist in unfiltered Tees water, as it arrives at the pumping station of the Darlington Corporation.

Coming now to deal with sample B. This sample was collected with all due precautions necessary to render it representative of the water being supplied to the town on the day it was taken. I found it to be clear, bright, and absolutely devoid of visible suspended matters. A full gallon left at rest for 72 hours did not deposit a sediment of any kind. Looking back to the fact that in sample A, after 72 hours rest there was marked turbidity, I cannot but attach great value to a system of filtration which could so entirely remove solid matters in such an extremely fine state of division. As a matter of mechanical filtration the result is *simply perfection*.

Having thus disposed of the very important question of suspended impurities, it will be well to compare the rate of dilution of the matters in solution for each sample. This is done in the subjoined table:—

		A.	B.
Nitrogen as nitrates	- - -	1 part in 2,500,000	- 2,500,000.
Chlorine	- - -	1 " 100,000	- 100,000.
Ammonia	- - -	1 " 100,000,000	- 200,000,000.
Albuminoid ammonia	- - -	1 " (Trace)	- 25,000,000.
Oxygen absorption at 80° F. in 15 minutes	-	1 " 470,000	- 551,181.
Oxygen absorption at 80° F. in 4 hours	-	1 " 285,132	- 332,541.
Total solid matter	- - -	1 " 6,354	- 6,666.
Suspended matter	- - -	1 " 140,000	- None.

It will thus be seen that in sample B those substances which can alone be looked upon as being derived from animal excreta have reached a point of extreme tenuity. Thus the nitrogen as nitrates gives one part in 2,500,000 of water, the ammonia, one part in 200,000,000 of water, the albuminoid ammonia one part in 25,000,000. Having regard, therefore, to the freedom of this sample from any trace of suspended matter, to the immense dilution of the matters referable to excretal sources, to the indefinite localities of those excretal sources, and to the extremely definite nature and the remarkably low numbers of the bacterial forms it contains (*bacterium termo*, and *bacterium subtilis* being the only forms discoverable), I have no hesitation in saying that Tees water as at present being supplied to consumers is of good and wholesome quality.

Yours faithfully,
(Signed) W. F. K. STOCK, F.C.S., F.I.C.,
Public Analyst for the County of Durham.

F. T. Steavenson, Esq.,
Town Clerk, Darlington.

(2.) REPORT by Mr. W. F. K. STOCK on CHEMICAL ANALYSES of WATER taken from (a) the RIVER TEES at the INTAKE of the DARLINGTON WATERWORKS, and (b) a TAP in the TOWN of DARLINGTON in JANUARY 1891.

County Analyst's Office, Darlington,
February 9, 1891.

SIR,

IN pursuance of your instructions of November last, requesting me to analyse samples of Tees water for your borough, I have to inform you that on the 27th and 29th of January 1891 I collected two samples, which I have marked C and D respectively, and have analysed the same with the following results:—

	C. Unfiltered, taken from Head of Draw-pipe.	D. Collected from Tap at North Road Station, North-Eastern Railway.
Colour and appearance in 2-foot tube	Opaque	Brownish yellow, not quite clear.
Smell when heated to 100° F.	Weedy	Not marked.
Nitrogen as nitrates	·0115	·0115
Chlorine as chlorides	·3500	·3500
Ammonia	·0021	·0021
Albuminoid ammonia	·0140	·0021
Oxygen absorption at 80° F. in 15 minutes	·2942	·1332
Oxygen absorption at 80° F. in four hours	·6568	·2289
Dissolved solids dried at 220° F.	7·2500	7·2500
Suspended solids dried at 220° F.	19·7500	trace
Total solids dried at 220° F.	27·0000	7·2500
Results of special microscopical examination under high power.	Much mineral matter. Vegetable debris. Myriads of moving organisms, including various bacteria	Few bacteria, fairly satisfactory.

Figures above give grains per Imperial gallon.

Sample C. was collected on the 27th of January at 11 o'clock in the forenoon, the river having been in heavy flood for eight hours. In order to avoid floating matter which would probably not enter the waterworks, this sample was taken from the head of the draw-pipe by which the water is lifted from the river, and it therefore represents the actual quality of the water pumped.

Sample D was collected at a tap in the porter's room at the North Road Station of the North-Eastern Railway Company, at 11 o'clock of the forenoon of the 29th January, exactly 48 hours after Sample C was taken from the waterworks. A glance at the dissolved solids and the chlorine in each case is sufficient to show that the flood water was on service at that point at the hour named.

As might have been expected under the circumstances, the water in the river (Sample C) compares badly with Sample A, analysed in November 1890. It contains solid matters in suspension to the extent of 19½ grains per gallon, or 2½ lbs. for every 1,000 gallons. This consists largely of sand and clay, but it contains also much organic matter of vegetable origin, whilst the animal contamination, as measured by products of decomposition, is three times as great as in

the November sample. The microscopical results are very instructive. There is, so far as I can make out after a long and patient search, a total absence of fibres of domestic origin, nor could I discover any of those matters which have before (in incipient flood) been the means of locating pollution, *e.g.*, dyed woollen fibres, exhausted dye stuffs, &c., but considering the time the flood had been running, and the dilution by fresh water, of which at least 20 per cent. was present, it is highly probable that such evidence had long passed the point at which my sample was taken. As a full gallon of the water was allowed to stand at rest for 48 hours, and again for 72 hours, in order to supply material for this examination, a very remarkable feature of the sample was the immense number of micro-organisms it contained, and, as somewhat to my surprise, the water did not become clear after standing for a week, I took the trouble to make a microscopical examination of the water itself apart from the deposit. The result of this examination was that I found the continued turbidity to be due entirely to the presence of bacteria. Taking this fact with what has been already said about the absence of matters of domestic or manufacturing origin, it appears important that too much stress should not be laid upon the presence of bacterial life in Tees water as pointing to pollution sources.

The net result of my analysis of this sample is that Tees water, as pumped on the 27th January 1891, was not a satisfactory source for public supply.

I now come to consider Sample D, and it will be seen on reference to the analytical data, that the vital difference existing between this sample and Sample C is due to the removal of suspended matter, the matters in solution being the same for each. It will also be seen that the water contained some bacterial forms of life. These, however, differ essentially from the forms found in the unfiltered water in that they were of one order only, and not bacilli, whereas in the unfiltered sample rod-like forms (bacilli) were the prevailing type. I state this only to show how exceedingly effective the filtering process must be to be able to remove so completely bodies so infinitely small.

The worst that can be said of Sample D is that there is a distinct falling off in the matter of colour and appearance as compared with the sample analysed in November last. I attach no importance to the micro-organisms found to be present, because I have lately noticed the same organisms in the public supply of three large towns in this county, and I fail to see how it is to be avoided in water which is stored in the open. The ammonia, which would be a bad feature in water from a close well, has not the same significance when found in river water, especially in time of flood when many thousand acres of rich arable and pasture land must have contributed to its presence. Taking all these points into consideration I am of opinion that Tees water, as supplied to the town on January 29, 1891, was good and wholesome drinking water.

Yours faithfully,

(Signed) W. F. K. STOCK, F.C.S., F.I.C.,

Public Analyst.

F. T. Steavenson, Esq.,
Town Clerk, Darlington.

(3) REPORT by Dr. FRANKLAND on the CHEMICAL ANALYSIS of a SAMPLE of WATER collected in MIDDLESBROUGH on AUGUST 18th, 1890.

Water Analysis Laboratory,
The Yews, Reigate Hills, Surrey,
23rd August 1890.

The Stockton and Middlesbrough Water Board.

GENTLEMEN,

HEREWITH I enclose results of analysis of the sample of water drawn from a tap in Middlesbrough on the 18th instant, by your General Manager, Mr. D. D. Wilson, and representing the supply furnished to the town by your Board.

The water is turbid, pale brown in colour, and has a peaty taste. It contains rather a large proportion of organic matter which, however, is entirely of vegetable origin—in fact soluble peaty matter due, no doubt, to the recent excessive rains. This peaty matter is harmless, but it gives to the water an unpleasant appearance and taste.

In all other respects the water is of excellent quality for domestic use, and it is free from any trace of sewage or animal contamination.

I am, Gentlemen,

Your obedient servant,

(Signed) E. FRANKLAND.

Results of Analysis expressed in parts per 100,000.

Number of Sample.	Description.	Chlorine.	Total Solid Matter.	Organic Carbon.	Organic Nitrogen.	Ammonia.	Nitrogen as Nitrates and Nitrites.	Total Combined Nitrogen.	Previous Sewage or Animal Contamination.	Hardness.			Remarks.
										Temporary.	Permanent.	Total.	
7,943	Sample of water drawn from tap in yard in Upper Albert Road, Middlesbrough, 18th August 1890. D.D.W.	0.7	10.52	1.005	.067	0	0	.067	0	0	5.6	5.6	{ Peaty taste, turbid, pale brown in colour.

(Signed) E. FRANKLAND.

(4) REPORT by Dr. FRANKLAND on the CHEMICAL ANALYSIS of a SAMPLE of WATER collected in MIDDLESBROUGH on OCTOBER 15th, 1890.

Water Analysis Laboratory,
The Yews, Reigate, 23rd October 1890.

The Stockton and Middlesbrough Water Board.

GENTLEMEN,

THE sample of water taken from an ordinary tap in the back yard of 70, Richardson Street, Middlesbrough, on the 15th instant has been submitted to analysis with the results contained in the enclosed table.

This sample is of much better quality than that reported upon by me in August last. It is but very slightly turbid, and is stained with peaty matter in solution to a comparatively slight extent. Although the organic carbon is still in greater proportion than is desirable, the very low amount of organic nitrogen demonstrates that the organic matter is entirely of vegetable origin.

The water is free from every trace of previous sewage or animal contamination, and the microscope reveals nothing of a deleterious character. It is a wholesome water of moderate hardness, and with the exception of a peaty taste, is in all respects of excellent quality, for dietetic and all other domestic uses.

I am, Gentlemen,
Your obedient servant,
(Signed) E. FRANKLAND.

Results of Analysis expressed in parts per 100,000.

Number of Sample.	Description.	Total Solid Matter.	Organic Carbon.	Organic Nitrogen.	Ammonia.	Nitrogen as Nitrates and Nitrites.	Total Combined Nitrogen.	Previous Sewage or Animal Contamination.	Chlorine.	Hardness.			Remarks.
										Temporary.	Permanent.	Total.	
7,968	Sample of water taken from an ordinary tap in the back yard of 70, Richardson Street, Middlesbrough, 15th October 1890	12.96	.424	.015	0	0	.015	0	0.8	2.7	6.0	8.7	{ Very slightly turbid, peaty taste.

(Signed) E. FRANKLAND.

The Yews, Reigate.

(5) REPORT by Dr. FRANKLAND on the CHEMICAL ANALYSIS of a SAMPLE of WATER collected in MIDDLESBROUGH on DECEMBER 22nd, 1890.

Water Analysis Laboratory,
The Yews, Reigate, 1st January 1891.

The Stockton and Middlesbrough Water Board.

GENTLEMEN,

HEREWITH I enclose results of analysis of a sample of water drawn from a tap in Municipal Buildings, Albert Road, Middlesbrough, on December 22nd last.

This sample is clear, palatable, and of excellent quality for dietetic and all domestic purposes. It is of moderate hardness, and contains only a minute amount of peaty matter.

I am, Gentlemen,
Your obedient servant,
(Signed) E. FRANKLAND.

Results of Analysis expressed in parts per 100,000.

Number of Sample.	Description.	Total Solid Matter.	Organic Carbon.	Organic Nitrogen.	Ammonia.	Nitrogen as Nitrates and Nitrites.	Total Combined Nitrogen.	Previous Sewage or Animal Contamination.	Chlorine.	Hardness.			Remarks.
										Temporary.	Permanent.	Total.	
8,022	Sample of water drawn from tap in Municipal Buildings, Middlesbrough, 22nd December 1890	19.20	.114	.029	0	.052	.081	0	1.2	6.8	5.0	11.8	Clear, no peaty taste.

(Signed) E. FRANKLAND.

The Yews, Reigate.

(6) REPORT by MR. ALFRED H. ALLEN on the CHEMICAL ANALYSIS of a SAMPLE of WATER COLLECTED in MIDDLESBROUGH on OCTOBER 17TH 1890.

Public Analyst's Laboratory,
67, Surrey Street, Sheffield,
October 27th, 1890.

Report on a Sample of Drinking Water.

Received from the Corporation of the Borough of Middlesbrough, on October 17th, 1890.

Physical characters.—

Suspended matter—Very slight amount.

Appearance of a column two feet in length—Clear and dark yellow.

Taste—Normal. Smell—None.

On analysis, the sample gave the following results :—

Total solid matter	-	-	-	-	-	10·85 grains per gallon.
Non-volatile matter	-	-	-	-	-	7·91 „
Loss on ignition	-	-	-	-	-	2·94 „
Chlorine	-	-	-	-	-	0·50 „
(Equivalent to chloride of sodium,	-	-	-	-	-	0·82 grains.)
Nitrogen existing as nitrates and nitrites	-	-	-	-	-	None.
Lead and other poisonous metals	-	-	-	-	-	None.

The sample had a hardness of 6·0 degrees. (Each degree represents a soap-destroying power equivalent to that produced by one grain of chalk per gallon).

The oxygen required by the changeable organic and other oxidisable matter amounted to 3·34 parts per million of the water.

On distillation, the sample yielded :—

Free ammonia	-	-	-	-	-	0·02 parts per million.
Albuminoid ammonia	-	-	-	-	-	0·12 „

The inorganic constituents of the solid matter were chiefly composed as follows :—

Silica	-	-	-	-	-	·53 grains per gallon.
Alumina and oxide of iron	-	-	-	-	-	Trace. „
Magnesia	-	-	-	-	-	2·33 „
Lime	-	-	-	-	-	3·11 „
Sulphuric acid (anhydrous)	-	-	-	-	-	2·56 „
Chlorine	-	-	-	-	-	0·50 „

The results of the analysis show the water to be of moderate hardness, and apparently of moorland origin. They negative any suspicion of contamination by sewage or cesspool drainage, but point to the presence of an unusually large amount of vegetable organic matter, apparently derived from peat. To this impurity the brownish colour of the water is to be attributed. No suspicious results were obtained on bacteriological and other microscopical examination.

(Signed) ALFRED H. ALLEN, F.I.C., F.C.S.,
Late President of the Society of Public Analysts

(7) REPORT by MESSRS. PATTINSON and STEAD on the CHEMICAL ANALYSIS of a SAMPLE of WATER COLLECTED in MIDDLESBROUGH, OCTOBER 15TH, 1890.

Laboratory and Assay Office,
5, Zetland Road, Middlesbrough,
October 29th, 1890.

We hereby certify that we have analysed the undermentioned sample of water, and that we find the following results :—

Sample received October 15th, 1890, marked “sample of water taken from ordinary tap in the back yard of 70, Richardson Street,” sealed, “Middlesbro’.”

Free ammonia	-	-	-	-	-	0·0010 grains per gallon.
Albuminoid ammonia	-	-	-	-	-	0·0084 „
Chlorine	-	-	-	-	-	0·7000 „
Oxygen absorbed on boiling with Perman-	-	-	-	-	-	1·0500 „
ganate of potash	-	-	-	-	-	„
Total solids	-	-	-	-	-	12·0000 „

The water was of a light brownish-yellow colour, and free from smell. The analysis shows it to be of a strongly peaty nature, but perfectly wholesome and free from any sewage contamination. The microscope reveals nothing of an objectionable character.

(Signed) PATTINSON AND STEAD.

Inspector Anderson.

- (8) REPORT on a CHEMICAL and BACTERIOLOGICAL EXAMINATION of TEES WATER, made at the request of DR. J. HAGUE CLEGG, the MEDICAL OFFICER of HEALTH for the BOROUGH of STOCKTON, by MR. A. C. WILSON, F.C.S., F.R.P.S., Borough Analyst.

SIR,

Chemical Laboratory, Exchange Buildings,
Stockton-on-Tees, August, 1891.

THE following are the results of a careful analysis of your sample of water received on the 24th instant, from the Stockton and Middlesbro' Public Water Supply:—

Description of sample	-	-	-	Surface water (<i>river in flood</i>).
Drawn	-	-	-	From public supply pipe in High Street.
Appearance in 2-foot tube	-	-	-	Dark brownish yellow—almost opaque.
Smell when heated to 100 F.	-	-	-	Peaty.
Chlorine in chlorides	-	-	-	·49.
Phosphoric acid in phosphates	-	-	-	Very slight trace.
Nitrogen in nitrates	-	-	-	None.
Ammonia	-	-	-	·0028.
Albuminoid ammonia	-	-	-	·0079.
Oxygen absorbed in 15 minutes at 80 F.	-	-	-	·504.
Oxygen absorbed in 4 hours at 80 F.	-	-	-	·728.
Hardness before boiling (Clark's Scale)	-	-	-	—
Hardness after boiling	-	-	-	—
Total solid matter dried at 212 F.	-	-	-	8·54.
Microscopical examination of deposit	-	-	-	Vegetable débris, moving micro-organisms, low forms of vegetable life.

This water is very heavily charged with organic matter of vegetable origin, there is, however, no appearance of animal pollution.

(Signed) A. C. WILSON.

Dr J. H. Clegg, Medical Officer,
Stockton-on-Tees.

Chemical Laboratory, Exchange Buildings,
Stockton-on-Tees, September 8th, 1891.

SIR,

As requested by you, I drew a sample of water from the public supply pipe on August 24th for chemical analysis and bacteriological examination, I have already reported on the former, and I now proceed to give the results of the latter.

On August 24th I inoculated three sterilized tubes of meat jelly with five drops of the water, and placed them in the incubator, keeping the temperature at 90 degrees Fahrenheit for four days, at the end of which period there was no growth or sign of micro-organisms. The tubes were again replaced in the incubator, and at the present time are perfectly clear.

On August 28th, another sample of water was drawn from the public supply pipe with the same precautions, and another tube inoculated and placed in the incubator at the same temperature, and with the same result.

On September 1st, a sample of water was drawn as above, and with the same result.

On August 24th, two sterilized plates of meat jelly were inoculated with 1 c.c. of water each, and placed in the incubator, and kept at 85 degrees Fahrenheit for four days, at the end of which period not the slightest growth was observed.

The apparatus in which the plates were kept consisted of a bell-jar with a ground glass flange at the bottom standing on a ground glass plate, and placed inside it were the two plates, one 2½ inches diameter and the other 3½ inches diameter, the former resting on the ground glass plate at the bottom, and the latter supported 3 inches above it by a nickel triangle.

To test the sensitiveness of the cultivating medium, the bell-jar was raised for half a minute, and the top plate exposed. In twenty-four hours another observation was made, when it was seen that a growth was beginning to form, and eleven distinct patches were counted, consisting entirely of *Penicillium*. On the under plate, which was protected, no growth has yet made its appearance.

On August 24th, I inoculated a flask of sterilized sugar solution with 10 c.c. of the water, and placed it in the incubator, and kept it at a temperature of 80 degrees Fahrenheit for two days, at the end of which time I observed a slight clouding of the liquid; I replaced it, and after allowing it to stand for forty-eight hours longer, I examined it under the microscope with $\frac{1}{12}$ inch object glass and B eye-piece, and found the growth to consist chiefly of chain micrococci and a few bacilli. The appearance of the cultivation much resembled the growth found in beer.

On August 24th I inoculated a sterilized flask of meat jelly with 1 c.c. of the water, and placed it in the incubator, but no growth has yet made its appearance.

This water is remarkably free from animal pollution, and as far as a chemical and microscopical examination can reveal, there is no appearance whatever of danger from this source.

There are low forms of vegetable life present which act as ferments, and these when taken into the body might under certain conditions, chiefly climatic, develop symptoms which might at first sight appear to be serious.

From the present and previous analysis of this water, it would appear that when the river is in flood, and the water, judging only by its appearance, is at the worst, it is in reality—owing to the large volume of water which is passing down in proportion to the ordinary pollution—the best and purest.

Dr. Clegg, Medical Officer,
Stockton-on-Tees.

Yours faithfully,
(Signed) A. C. WILSON.

APPENDIX H.

REPORTS MADE TO THE CORPORATION OF DARLINGTON IN 1887, WITH RESPECT TO THE POLLUTION OF THE RIVER TEES.

(1) Report by Mr. COUNCILLOR DRURY.

SIR,

25th June 1887.

ON June 25th, 1887, I visited Barnard Castle with Dr. Manson, for the purpose of examining the state of the river foreshore and the sewage outfalls near and into the river. I could scarcely have believed that such a disgraceful state of pollution of a river could have existed, at this time of day, anywhere in England. What I saw decided me to pay another visit, and if possible obtain some photographs of the scene; and accordingly I again visited the place on June 28th, 1887, but Dr. Manson was unable to go with me on this day. I crossed the river by the large stone bridge and gained access to the Yorkshire shore of the river by some stone steps near Ullathorne's Mill. Owing to the long drought which had existed for twenty-eight days, during which time no rain had fallen, the river was very low, so that the foreshore extended to nearly 30 feet from the walls of the houses built on the river banks, and there is scarcely a yard of this foreshore but which is covered with a thick coating of semi-fluid sewage and filth. The stench is fearful. Between the bridge and Ullathorne's Mill the line of houses, all tenanted, built on the river bank, extends to about 135 feet, and from these houses as well as those on the opposite side of the street (Bridge-end Street), the whole of the sewage and midden deposits are discharged directly on to the foreshore.

In the walls of this property there are eight sewer openings, six of them giving exit from privies or sewers of the adjoining property. Two others were partially stopped with nearly solid matter, and did not seem at the time to be discharging anything. Of the six above mentioned, one is an overhanging privy which was twice used during the time of my inspection. Another is a sloping scupper-like opening in the wall, which at the time of my visit was laden with excrement, only waiting further deposits from behind to cause it to drop in a solid lump on to the stones below.

One opening comes from an urinal at the end of the bridge, and the other three from higher stories of the same property.

On this same length of foreshore (135 feet) there are six distinct heaps of the ordinary midden character, viz., human excrement, slops, animal and vegetable refuse, dirty straw, ashes, &c.

So far as I was able to judge the quantity of each heap was as follows:—

1 heap,	about 1 cartload.
1 "	$\frac{1}{2}$ "
4 heaps	$\frac{1}{4}$ "

These four latter heaps consisted almost entirely of human excrement.

From these sewers and privies during the time occupied in my examination (33 minutes) there were 15 discharges.

Between the west end of this property and the steps adjoining Ullathorne's Mill there is a space of 15 feet, and this space the inhabitants seem to use as a common midden. It contained vegetable and animal refuse, ashes, &c., and some wood chips, evidently the sweepings of a workshop. Owing to its peculiar position and the want of further assistance, I was unable to take an accurate measurement of this heap, but I should say it contained about 12 or 14 cartloads. The heap measured 15 feet from the apex against the wall to the base. The highest point of this refuse was about 5 feet below a stone inserted into the wall which bore this inscription, "Great flood line, March 9th, 1881." I concluded, therefore, that even a partial flood would gradually sweep the whole of the heap into the river.

Below the bridge on the same side of the river there is some property about 81 feet in extent, and here there are eight sewer openings discharging solid and liquid filth. During the few minutes I was examining this portion there was four discharges, principally fluid.

DURHAM SIDE.

In the wall just below the bridge there are two sewers continually discharging liquid sewage. In the block of buildings immediately east of this I could only see one privy outfall. From this point from about 400 feet there are four privies discharging their contents directly on to the foreshore.

There are 11 sewers giving exit to liquid sewage and filth. In addition there was one pipe discharging waste dye, and one arched drain much broken and apparently blocked as there was little or nothing coming from it.

On this foreshore there are six midden deposits, the amount of which I estimated as follows:—

1 heap containing about 2 cartloads.

1	"	"	$\frac{1}{2}$	"
1	"	"	5	"
1	"	"	4	"
2 heaps	"	"	3	"

Besides this, at the end of two of the lanes leading from Bridge Street to the river side, there were very large heaps of rubbish of various materials, but principally old mortar and building refuse.

An exposed 6-inch glazed pipe drain has been broken, probably in tipping the rubbish at the end of one of these lanes. It was continually discharging large quantities of a dirty black fluid; but whether this was from a cess or only street drainage, I could not say. It had only a slightly offensive smell.

I also examined some of the yards of the houses in Bridge Street and found their sewer grates in three instances, stopped up and flowing over for a considerable extent with stinking, dirty water, which would in all probability at one time or other find its way into the river.

The main sewer of Barnard Castle empties itself into the river at a point a short distance below the town.

The sewage from the County School is received into subsiding tanks opposite Sendall's Mill. The liquid portion percolates through gravel beds into the river, and is therefore in all probability innocuous.

Dealing with these facts I have come to the following conclusions:—

- 1st. In the ordinary state of the Tees, although the amount of liquid sewage discharged into the river at Barnard Castle is very large, it is quite possible that in the course of its long journey to the Darlington intake, allowing for a considerable subsidence of the more solid particles, the remainder becomes so oxidized and altered that it ceases to have any serious import, and that the water may be fairly pure and fit for drinking purposes.
- 2nd. That when a partial flood of the Tees occurs, especially after a long drought, a very strong element of danger exists, and I am of opinion that then the water at the Darlington intake cannot be pure or fit for drinking purposes. My reasons for this opinion are these. During a drought these midden and sewage deposits, such as I have tabulated in this report, are continually accumulating and lie undisturbed on the foreshore, and any disease germs which may be in them have time to develop and increase, so that when the partial flood comes they are carried into the stream in a very active condition and in increased numbers. The increased rapidity of the current carries them more quickly down to our intake, so that time alone, leaving out of the question limited subsidence, is wanting to complete their destruction.
- 3rd. In a very full flood the volume of water may have a mitigating influence, but its force will carry everything before it at the very first flush, so rapidly that in all probability a short suspension of pumping operations at the intake would obviate the possibility of any danger to the inhabitants of Darlington.

I remain Sir,

Yours obediently,

(Signed) CHARLES D. HILL DRURY,
Fellow of the Royal Medical and Chirurgical
Society, London.

To F. T. Steavenson, Esq.,
Town Clerk.

(2.) Report by Mr. COUNCILLOR MANSON.

River Pollution at Barnard Castle.

It being thought desirable to have evidence as to the cause of the pollution of the River Tees below Barnard Castle, increasing in a very marked degree after every freshet or flood, on June 25th, 1887, in company with Dr. Drury, I visited and examined the arrangements for the disposal of the sewage at that town.

The Tees was very low, thus affording ample opportunity for investigating both sides of the river bed.

It may be conveniently mentioned here that the main sewer drainage of Barnard Castle is conveyed in the usual way into the river below the town.

The drain-pipes employed for that purpose convey the sewage material produced by a very considerable portion of a population numbering about 7,000 persons, and are, therefore, in constant use. Contamination of the Tees from that source is necessarily continuous, but, as will be explained after, is intermittent in intensity.

Crossing the Suspension Bridge and so from the Yorkshire side observing the houses in the town opposite, it was seen that much of the disposal of refuse and excreta is managed very primitively, and with extreme economy as regards drains and pipes for various short spouts

projecting from the walls of the houses and communicating with the privies are made to do duty instead of sewers, and down them were seen dropping the faecal matters on to the bed of the river below. The openings of various dust bins and ashpits were also visible, and their overflowed contents were strewn on the rock beneath. Indeed, the river side appeared to be the general outlet for all the refuse from that part of Barnard Castle, known as Briggate. Chaff from old beds, ashes, human excreta, and all the debris of a somewhat crowded and low class community were plentifully visible. Descending to the river-bed, at the stone steps, near the Bridge Mill, similar evidence was visible to the eye and patent to the nostrils, of the utility of the river as a scavenger to the inhabitants on the Yorkshire side also.

Pools of decaying slush, mounds of faecal matter, heaps of house refuse, were all mingled in ample profusion. One house had a roofed stone cupboard-like projection built out firmly and even ornamentally from the gable facing the river, at a height of 12 feet above it. This was found to be the "accommodation" of the premises, and the trouble of water flushing as in a w.c., or of emptying, as in an ordinary privy, was avoided simply and easily by allowing the evacuations to fall directly on to the river side.

The whole scene was disgusting and offensive.

Visiting next the Durham side, and descending to the river-bed, there were revealed in more detail the pollutions which had been previously observed from across the river.

Cartloads of rubbish had been recently laid down in readiness for a flood to remove them; a socketed drain-pipe emptying black sewage from Briggate opened on to the river side close to another drain from some manufactory where coloured fluid was issuing, and the same filthy mass, of nauseating odour and horrible appearance was seen bordering the river from bridge to bridge.

The practical conclusions from what was observed, are these—

The whole of the sewage water and very much of the excreta and refuse of Barnard Castle are, without compunction, committed to the River Tees to dispose of. The bed of the river is hard rock, and anything deposited on it in dry weather is therefore easily swept away when a flood comes. The increased contamination observed after a freshet or flood is due to the following facts:—

- 1st. That on such occasions, the water rises to and carries away all the filthy matters accumulated perhaps for weeks on the river side.
- 2nd. That the mouths of such sewers as do exist are at the flood time, scoured out, and sludge and filth deposited at their outlets washed away.
- 3rd. That any rainfall at Barnard Castle which may cause a freshet, washes out into the river any dried up or semi-liquid putrifying substances which lodge in the sewers in dry weather, and thus increases the amount of pollution discoverable in the water at the intake of the Corporation Waterworks, and also accounts for the intermittency of the intensity of contamination from this particular source.

The pollution of the Tees by Barnard Castle sewage is a demonstrable and odious fact.

28th June 1887.

RD. TAYLOR MANSON.

(3.) Extracts* from the Report of Dr. HARE on Bacteriological Examination of Tees Water.

* * * * *

The Plan of Experimentation.

The condition of the water at various points of the river's course was tested according to Koch's method, in order that a comparison might be established between its relative purity in different areas, and the presence of sewage contamination detected (if it had taken place), and localised as regards its origin. The following points were chosen for this examination, for the reasons now stated:—

- a. Above Barnard Castle (between Lartington Beck and Barnard Castle), to demonstrate the condition of the river before sewage enters it from that town.
- b. Below Barnard Castle (below point of sewage entrance), to show the immediate effect upon the water of the addition of the town sewage.
- c. Immediately above Staindrop Beck, at its confluence with the Tees, to show what proportion of the Barnard Castle contamination persisted at that point, before possible additions from Staindrop and at Gainford.
- d. Immediately below Gainford; to show whether the addition of the Staindrop and Gainford sewage produced a great increase of the contamination, and to assess the proportionate value of that addition to the contamination, as compared with the total contamination of the river.
- e. At Low Coniscliffe, immediately above the Pumping Station; to ascertain whether the contamination, from whatever source derived, persisted at that point.
- f. Lastly, the Darlington Tap-water, to test the effect of filtration at the waterworks upon the water supply of the borough.

* The matters here omitted from Dr. Hare's report are for the most part descriptions of bacteriological methods adopted, references to a so-called standard of "permissible impurity," and references also to lithographs which illustrated his text.

At each of these points the test was applied in the following way:—Ten tubes containing sterilised nutrient jelly were inoculated with the river water, taken direct from the stream with a steril glass pipette, in the following proportions:—

2	tubes of sterile jelly with one drop each.
2	do. two drops „
2	do. three drops „
2	do. four drops „
2	do. five drops „

(The pipettes employed give 20 drops to the cubic centimeter of water.)

This part of the experiment was in each case performed in the bed of the stream. The samples from all six areas were taken on one day (May 20th, 1887), and with the contents of each of the 70 tubes thus inoculated, a plate cultivation was established the same evening in the temporary laboratory at Low Coniscliffe. The plate cultivations were preserved from atmospheric contamination in bell jar chambers . . . and, to check the results which might accrue, a series of “control plates” was also established. . . .

Conditions affecting the Experiments.

Owing to a sudden and violent storm, with heavy rain and some snow, on the 20th of May, the river was examined under altering conditions. The areas of the river at Low Coniscliffe, below Gainford, and above Staindrop Beck, where examined while the stream was still low from previous continued dry weather. The examinations immediately above and just below Barnard Castle were made with the river in a much swollen condition—the result of five hours heavy rain. This rain was specially heavy at Barnard Castle, and resulted in an exceptionally thorough flushing of the drains of that town into the River Tees. In consequence of the sudden increase in the river's flow, a second examination was made in the evening at Low Coniscliffe, to compare with the results obtained from the corresponding experiment made in the early morning, when the water was still low. This comparison is seen in Tables V. and VII., and it illustrates very strikingly the difference in the purity of the water under different meteorological conditions. During the four days following this storm the river gradually fell; on the fourth, it had lost the muddy torrential character assumed directly after the storm; but on the evening of that day there was a second slight subsidiary rise in its height. The Darlington rainfall from the 10th to the 24th of May is added here, to illustrate the most important of the meteorological factors in question.

Rainfall at Darlington during May 1887, measured daily at 9 a.m., and dated for the day preceding that on which the morning measurement is taken.

May 10 - - - 0·00 inch.	May 15 - - - 0·00 inch.	May 20 - - - 0·15 inch.
„ 11 - - - 0·01 „	„ 16 - - - 0·00 „	„ 21 - - - 0·06 „
„ 12 - - - 0·13 „	„ 17 - - - 0·27 „	„ 22 - - - 0·01 „
„ 13 - - - 0·00 „	„ 18 - - - 0·01 „	„ 23 - - - 0·00 „
„ 14 - - - 0·00 „	„ 19 - - - 0·44 „	„ 24 - - - 0·21 „

In the week preceding the 19th and 20th May there had been a rainfall of but 0·28 inch, four of the days having been rainless; whereas on the night of the 19th and morning of the 20th there was a fall of 0·59 inch, which corresponds to the sudden rise of the river experienced on the 20th.

Results of the Experiments.

These can be most easily detailed in a series of tables, showing the average number of microbes per drop, and their nature, in the water of each of the areas examined. These tables contain an account of each plate cultivation made, the number of drops of water tested by each, and the individual, aggregate, and average results of the tests thus applied. The results of the experiments with “Control” plates show that the precautions taken for the exclusion of error were sufficient and satisfactory.

TABLE I.—Showing NUMBER of MICROBES, as estimated by KOCH'S TEST, in TEES WATER, above Barnard Castle (river high).

Plate.	Drops of Water.	Liquefying Colonies of Microbes.	Total Colonies of Microbes.	Average Liquefying Colonies per Drop.	Average Total Colonies per Drop.
I. - - -	5	11	88	2	18
II. - - -	5	15	96	3	19
III. - - -	4	16	151	4	38
IV. - - -	4	20	185	5	46
V. - - -	3	6	100	2	33
VI. - - -	3	16	106	5	34
VII. - - -	2	1	43	1	21
VIII. - - -	2	10	79	5	39
IX. - - -	1	1	45	1	45
X. - - -	1	1	29	1	29
XI. (control) -	0	0	0	0	0
	30 drops	97 total	922 total	3 average	31 average

TABLE II.—Showing NUMBER of MICROBES, as estimated by KOCH'S TEST, in TEES WATER, *below Barnard Castle (river high).*

Plate.				Drops of Water.	Liquefying Colonies of Microbes.	Total Colonies of Microbes.	Average Liquefying Colonies per Drop.	Average Total Colonies per Drop.
I.	-	-	-	5	99	564	20	113
II.	-	-	-	5	91	550	18	110
III.	-	-	-	4	65	370	16	92
IV.	-	-	-	4	55	396	14	99
V.	-	-	-	3	62	309	21	103
VI.	-	-	-	3	33	212	11	71
VII.	-	-	-	2	33	202	16	101
VIII.	-	-	-	2	14	120	7	60
IX.	-	-	-	1	12	77	12	77
X.	-	-	-	1	6	88	6	88
				30 drops	470 total	2,888 total	16 average	96 average

TABLE III.—Showing NUMBER of MICROBES, as estimated by KOCH'S TEST, in TEES WATER, *immediately above Staindrop Beck (river low, but rising).*

Plate.				Drops of Water.	Liquefying Colonies of Microbes.	Total Colonies of Microbes.	Average Liquefying Colonies per Drop.	Average Total Colonies per Drop.
I.	-	-	-	5	28	380	6	76
II.	-	-	-	5	32	362	6	72
III.	-	-	-	4	19	226	5	56
IV.	-	-	-	4	16	230	4	57
V.	-	-	-	3	12	157	4	52
VI.	-	-	-	(3)	This experiment accidentally spoiled by breakage of a tube.			
VII.	-	-	-	2	16	118	8	59
VIII.	-	-	-	2	10	109	5	54
IX.	-	-	-	1	7	46	7	46
X.	-	-	-	1	4	57	4	57
XI. (control)	-	-	-	0	0	0	0	0
				27 drops	144 total	1,685 total	5 average	62 average

TABLE IV.—Showing NUMBER of MICROBES, as estimated by KOCH'S TEST, in TEES WATER, *below Gainford (river low).*

Plate.				Drops of Water.	Liquefying Colonies of Microbes.	Total Colonies of Microbes.	Average Liquefying Colonies per Drop.	Average Total Colonies per Drop.
I.	-	-	-	5	49	218	10	44
II.	-	-	-	5	74	374	15	75
III.	-	-	-	4	28	156	7	39
IV.	-	-	-	4	29	164	7	41
V.	-	-	-	3	11	113	4	38
VI.	-	-	-	3	11	103	4	34
VII.	-	-	-	2	10	95	5	47
VIII.	-	-	-	2	8	86	4	43
IX.	-	-	-	1	5	46	5	46
X.	-	-	-	1	4	35	4	35
XI. (control)	-	-	-	0	0	0	0	0
				30 drops	229 total	1,390 total	7 average	46 average

TABLE V.—Showing NUMBER of MICROBES, as estimated by KOCH'S TEST, in TEES WATER, at Pumping Station (river low).

Plate.	Drops of Water.	Liquefying Colonies of Microbes.	Total Colonies of Microbes.	Average Liquefying Colonies per Drop.	Average Total Colonies per Drop.
I. - -	5	41	224	8	45
II. - -	5	32	204	6	41
III. - -	4	26	153	6	38
IV. - -	4	23	145	6	36
V. - -	(3)	This experimental plate accidentally spoiled.			
VI. - -	3	17	109	5	36
VII. - -	2	14	68	7	34
VIII. - -	2	13	81	6	44
IX. - -	1	6	32	6	32
X. - -	1	6	29	6	29
	27 drops	178 total	1,052 total	6 average	39 average

TABLE VI.—Showing NUMBER of MICROBES, as estimated by KOCH'S TEST, in TEES WATER, as supplied after FILTRATION to the BOROUGH of DARLINGTON. Tap-water (river low).

Plate.	Drops of Water.	Liquefying Colonies of Microbes.	Total Colonies of Microbes.	Average Liquefying Colonies per Drop.	Average Total Colonies per Drop.
I. - -	5	5	42	1	8
II. - -	5	4	29	1	6
III. - -	4	0	15	0	4
IV. - -	4	3	18	1	4
V. - -	3	0	10	0	3
VI. - -	3	2	14	1	5
VII. - -	2	5	17	2	8
VIII. - -	2	1	11	0	5
IX. - -	1	0	4	0	4
X. - -	1	0	5	0	5
XI. (control) -	0	0	0	0	0
	30 drops	20 total	165 total	1 average	5 average

TABLE VII.—Showing NUMBER of MICROBES, as estimated by KOCH'S TEST, in TEES WATER, at Pumping Station, Three Hours after rise of River (River high).

Plate.	Drops of Water.	Liquefying Colonies of Microbes.	Total Colonies of Microbes.	Average Liquefying Colonies per Drop.	Average Total Colonies per Drop.
I. - -	5	37	410	8	82
II. - -	5	85	396	17	79
III. - -	4	42	290	10	72
IV. - -	4	79	346	19	86
V. - -	3	72	230	24	76
VI. - -	3	78	296	26	99
VII. - -	2	77	346	38	173
VIII. - -	2	41	227	20	113
IX. - -	1	21	118	21	118
X. - -	(1)	This cultivation accidentally spoiled.			
XI. (control) -	0	0	0	0	0
	29 drops	532 total	2,659 total	18 average	92 average

The general results of this series of observations may be stated as follows:—

- The amount of organic matter present in the Tees is large, as evidenced by the large numbers of microbes to be found in the water.
- In all the areas examined, both putrefactive and non-putrefactive microbes are present; their relative and their absolute numbers differ considerably in different parts of the river. The relative proportion of each in the water bears an obvious relation to the kinds of organic matter entering the river at different points in its course.
- There is a great difference between the purity of Tees water in low and in high states of the river flow.

The differential results of these experiments made by comparing the figures in the foregoing tables afford conclusive evidence as to the areas of chief contamination, its amount in each area, and its significance as affecting the purity of the river as a source of water supply.

Table I. gives evidence of the state of the river in time of high water immediately above Barnard Castle. The water contained an average of 31 microbes per drop, estimable by the test

employed. . . . The qualitative test shows that an average of three microbes per drop (or one-tenth of the whole number) are of the species which produce liquefaction of the test jelly. . . . And it is further to be noted of these colonies of liquefying microbes, that they lack the sewage odour and muddy green colour of those most closely associated with the early stages of putrefaction, as seen in *fresh* sewage. . . .

Table II. shows the state of the river *in time of high water* 300 yards (*circa*) below the point of entrance of the Barnard Castle main sewer. The water contains an average of 96 microbes per drop, as estimated by the test . . . The qualitative test shows that an average of 16 microbes per drop produce liquefaction of the test jelly. These colonies, almost without exception, show the typical characteristics of putrefactive microbes, and demonstrate the presence of an abundant quantity of fresh sewage matter in a state of active putrefaction. . . .

Tables III, IV., and V. give evidence of the state of the river *in time of low water*. Table III. shows the amount of contamination persisting in the Tees at its confluence with Staindrop Beck; Table IV. shows the influence of Staindrop and Gainford sewage upon that contamination; and Table V. demonstrates what proportion of the total contamination remains in the water as abstracted at the Pumping Station.

Immediately above Staindrop Beck the river water is still crowded with microbes, averaging 62 per drop. . . . Of these, an average of five microbes per drop are putrefactive, and give evidence of a certain persistence of unaltered sewage material in the water at that point. Below Gainford the average total of microbes per drop has fallen to 46. . . . The putrefactive microbes have risen from an average of five per drop to seven per drop, showing that the sewage contamination due to Staindrop and Gainford is appreciable, and corresponds to two fifths of that persisting from Barnard Castle. At the Pumping Station, in low water, the average total of microbes has fallen to 39 per drop, and the putrefactive to an average of 6 per drop. Corresponding to this degree of relative purity *in the river at low water* we find in Table VI. evidence of considerable purity in the town supply after pumping and filtration; the total number of microbes being reduced in it to an average of 5 per drop, and the proportion of putrefactive species to less than 1 per drop, (But compare results of second series of experiments, p. 22.)

Table VII. gives evidence of the condition of the water at the Pumping Station *in time of high water*. The water is now loaded with microbes, containing on an average 92 per drop; of these, 18 per drop are typically putrefactive, and give evidence of the presence of unaltered sewage matter in large quantities, and the experiment shows the river at this point to be as polluted as it is immediately below Barnard Castle, as shown in Table II.

Conclusion from foregoing Results.—The cause of the difference in purity in the water at the Pumping Station, in a low and in a swollen state of the river, obviously depends upon the greater rapidity with which fermenting material poured into the Tees is washed down in the latter state of the river's flow. This rapidity of transit precludes the natural diminution of organic matter observed in periods of less rapid flow (*vide* Tables III., IV., and V.). Instead of a diminution there may even be an increase of microbes in the water at the Pumping Station from the abundance of organic matter present in the river in such circumstances, which allows of their multiplication in the water (*vide* Table VIII., Second Series). The heavy rains causing the flooded state of the river scour out fermenting matters from the drains, which enter the river; and in addition to this source of fresh sewage, deposits of sewage mud at or near the points of sewage contamination are, in times of flood, stirred up and washed away by the tumultuous condition of the river, thus adding further to the pollution of its water.

Further Experiments and their Results.

In the preceding section are detailed the results of the experimental inquiry instituted on the 20th May. A second series of experiments remains to be detailed, by which the condition of the river water at the Pumping Station, and of that supplied to the town, was tested daily for the four succeeding days. The facts elicited are contained in a series of tables constructed on the same principle as those in the preceding section.

TABLE VIII.—Showing NUMBER of MICROBES, as estimated by KOCH'S TEST, in TEES WATER, at Pumping Station, Ten Hours after Rise of River.

Plate.	Drops of Water.	Liquefying Colonies of Microbes.	Total Colonies of Microbes.	Average Liquefying Colonies per Drop.	Average Total Colonies per Drop.
I. - - - -	5	168	590	34	118
II. - - - -	5	104	462	21	92
III. - - - -	4	134	420	33	105
IV. - - - -	4	142	510	35	128
V. - - - -	3	137	432	45	144
VI. - - - -	(3)	Experiment spoiled by accident.			
VII. - - - -	2	72	348	36	174
VIII. - - - -	2	53	296	27	148
IX. - - - -	1	16	178	16	178
X. - - - -	1	27	216	27	216
XI. (control) -	0	0	0	0	0
27 drops		853 total	3,452 total	32 average	128 average

TABLE IX.—Showing NUMBER of MICROBES, as estimated by KOCH'S TEST, in *Darlington Tap-Water*, Twenty-seven Hours after Rise of River.

Plate.	Drops of Water.	Liquefying Colonies of Microbes.	Total Colonies of Microbes.	Average Liquefying Colonies per Drop.	Average Total Colonies per Drop.
I. - - -	5	35	438	7	87
II. - - -	4	29	254	7	63
III. - - -	3	9	84	3	28
IV. - - -	2	5	56	3	28
V. - - -	1	3	21	3	21
	15 drops	82 total	853 total	5 average	57 average

TABLE X.—Showing NUMBER of MICROBES, as estimated by KOCH'S TEST, in TEES WATER at the *Pumping Station*, Forty Hours after Rise of River.

Plate.	Drops of Water.	Liquefying Colonies of Microbes.	Total Colonies of Microbes.	Average Liquefying Colonies per Drop.	Average Total Colonies per Drop.
I. - - -	5	122	542	24	108
II. - - -	4	108	508	27	127
III. - - -	3	55	224	18	74
IV. - - -	2	49	189	24	94
V. - - -	(1)		Plate broken.	Experiment spoiled.	
VI. (control) -	0	0	0	0	0
	14 drops	334 total	1,463 total	24 average	104 average

TABLE XI.—Showing NUMBER of MICROBES, as estimated by KOCH'S TEST, in *Darlington Tap-water*, Fifty Hours after Rise of River.

Plate.	Drops of Water.	Liquefying Colonies of Microbes.	Total Colonies of Microbes.	Average Liquefying Colonies per Drop.	Average Total Colonies per Drop.
I. - - -	5	7	35	1	7
II. - - -	4	6	32	1	8
III. - - -	3	6	25	2	8
IV. - - -	2	0	9	0	4
V. - - -	1	4	13	4	13
VI. (control) -	0	0	0	0	0
	15 drops	23 total	114 total	2 average	7 average

TABLE XII.—To save space, the RESULT of FOUR further EXPERIMENTS, comprising Twenty-two Plate Cultivations are placed together, thus.

Water examined.	Hours after rise of River.	Average Liquefying Colonies per Drop.	Average Total Colonies per Drop.
Pumping Station - - -	52 hours	5	47
Pumping Station - - -	66 „	7	40
Darlington Tap - - -	71 „	4	21
Pumping Station - - -	76* „	18	121

* The river had risen again several inches when this experiment was made on May 23rd at 8 p.m.

The general results of this series of observations are :—

- 1 On the occurrence of a sudden rise in the river's flow, and for 40 hours after its onset, there is a great increase in the organic matter present in the Tees water at the Pumping Station; and there is, at such a period, evidence of the abundant presence of unaltered sewage matter.
- 2 The filtering processes carried on at the waterworks greatly reduce the amount of organic matter in the water as supplied to the consumers; but during a period of high water in the river, the water as supplied in the town shows the presence of organic matter which is in part composed of fresh sewage material.

The differential results obtained by comparing the figures presented in Tables VIII., IX., X., XI. and XII., afford confirmation of the statement that a rapid flow and a swollen condition of the river are associated with an increased amount of organic matter in the water at the pumping station. Table VIII. exhibits the presence of an average of 128 microbes per drop of the water, of which an average of 32 per drop are putrefactive microbes. This shows an increase of both as compared with the results obtained immediately below Barnard Castle (Table II.), and indicates either a multiplication of microbes in their course down the river, due to the abundant presence of organic matter in its water, or that the maximum sewage contamination does not take place at once on the rise of the river, but occurs after some hours. Whatever the cause, the practical deduction from the large proportion of the microbes present in the water at the pumping station is, that 10 hours after a sudden rise of the river the water is contaminated to such a degree with organic matter as to render it quite unfit for human use. Table X. shows that this condition of the water persists up to 40 hours after the occurrence of the freshet, up to which time unaltered sewage is present in the water in a marked degree. Table IX. shows the condition of the town water supply during this interval, giving an average of 57 microbes per drop, of which an average of five microbes per drop are putrefactive, and showing that a distinct trace of fresh sewage material is present in the water as furnished to the consumers. . . . The remaining tables, show a marked diminution in the amount of organic matter, both in the river water and the town supply, occurring after the 40 hours of greatly increased pollution. By 52 hours after the freshet, the river had returned to a condition of relative purity . . . and a similar improvement had taken place in the filtered water supplied to the town. A secondary rise of the river on the 23rd May, 76 hours after the freshet of the 20th, was associated with a return to marked organic contamination, and the presence of unaltered sewage matter.

Conclusion.

In low states of the river there is evidence of sewage contamination within the Darlington area of the River Tees, more than half ($\frac{3}{4}$ ths) of that contamination being traceable to the addition of the Barnard Castle sewage to the water of the river.

In flooded states of the river there is evidence of profound sewage contamination within the Darlington area. This profound sewage contamination is not present above Barnard Castle; it appears shortly below that town, and it persists in the water of the Tees at the pumping station for the Darlington town supply.

(4.) Report by Mr. W. F. K. STOCK.

"Tees Pollution Inquiry."

SIR,

Darlington, June 13, 1887.

I HAVE to report to you that in accordance with the instructions issued by you on behalf of the Committee appointed to consider the above question, I proceeded on May 21st to collect the necessary samples of Tees water in company with Dr. Arthur Hare, of Edinburgh, who has charge of the Biological Section of this inquiry, and who instituted his experiments on that date in order that his work and mine should agree as to the character of the water operated upon.

For reasons connected with Dr. Hare's work the collection of samples was commenced at a point just above the intake of the Darlington Corporation Waterworks. This sample is marked No. 1 in the table accompanying the report. Sample No. 2 was got at a point about 300 yards below the lowest sewage outfall at Gainford. No. 3 a short distance above Staindrop Beck. Up to this the river had preserved what, after 20 years knowledge of it, I should consider to be its ordinary spring volume. But by the time we reached the Lending's Mill, about half a mile below Barnard Castle, from whence sample No. 4 was taken, a sudden freshet came down, which quite doubled the flow of water and destroyed the continuity of the series of samples I had in contemplation. However it was thought desirable to examine the flood water, both below and above Barnard Castle, and sample No. 5 was collected at the low end of Bridge End Mill dam, that is between the junction of Lartington or Deepdale Beck with the Tees and Barnard Castle. It need hardly be said that every care was taken to obtain perfectly fair and average samples. The influence of tributary streams being duly noted and allowed for.

It being absolutely necessary to the purposes of this report that I should complete the sampling of the river in its ordinary condition, I made provision for trustworthy information being conveyed to me, and on June 6th I again visited Barnard Castle and obtained samples Nos. 6 and 7 corresponding in locality with the flood samples Nos. 4 and 5.

Besides these seven samples I shall have to refer to two others, namely:—No. 1A, taken on the evening of May 21st just above Darlington Corporation Waterworks intake to show the influence of flood water at that point, and No. 8 drawn from the town supply on June 4th to furnish information as to the quality of the water as used by the inhabitants of Darlington.

It is well that I should, at this stage of my report, indicate the nature of the information which it was anticipated would be afforded by analysis of the five samples originally intended to be taken from the river. Obviously the intake sample would give the quality of the water pumped by the Corporation.

The difference between No. 2 and No. 3 would show whether any perceptible pollution was attributable to the drainage of Gainford and the influx of the Staindrop Beck.

No. 6 (for No. 4 flood water) compared with No. 3 was intended to indicate the increase of pollution due to Barnard Castle alone, the analysis of No. 7 (for No. 5 flood water) being necessary to fix any such increase upon Barnard Castle, and also to furnish a basis for the estimation of the total contamination present in Tees water as found at the pumping station of the Corporation of Darlington.

I now come to deal with the conclusions I have arrived at from the analytical data I have the honour of placing before you.

In the first place I have no hesitation in saying that under ordinary conditions the water at the intake of the Darlington Corporation's Waterworks is distinctly better in quality than it is above Barnard Castle, and that as supplied from the Corporation mains it does not contain a particle of unaltered sewage. In my opinion three conditions contributed to this, to me, very unexpected result, 1st, subsidence in still pools; 2nd, decomposition by oxidation; 3rd, assimilation of nitrogenous matter by myriads of living organisms.

There can be no question that the river is largely polluted by the filth of Barnard Castle, and in less degree by the influx of Staindrop Beck and Gainford sewage; besides a few other minor impurities and a not inconsiderable amount of drainage from tillage land, the influence of which makes itself most felt in the early part of the year. But it is equally true that owing, as I believe to the three causes already mentioned, these pollutions cease to be recognisable at the pumping station of the Corporation Waterworks.

Unfortunately for the inhabitants of Darlington a very different state of things exists in times of partial flood. Comparing the analysis of the three flood waters, I find, 1st, a decided access of sewage due to Barnard Castle, and 2nd, the existence of sewage matter in an unaltered condition at the Darlington Corporation's intake. It must be understood that when I speak of sewage I class under this description town refuse of various kinds with the actual contents of the sewers, and I have no doubt whatever that the pollution found in the Tees at Darlington during partial flood is very largely due to filth washed down from Barnard Castle. To say nothing of the total sewerage of that town falling directly into the river, the whole riverside population, on both sides, use the stream as a common depository for all kinds of unmentionable abominations. I speak from my own knowledge, and I say, without fear or favour, that the way in which the Tees water is seasoned at Barnard Castle for use by the inhabitants of Darlington is absolutely scandalous.

I am, Sir,

Yours faithfully,

W. F. K. STOCK.

F. T. Steavenson, Esq.,
Town Clerk, Darlington.

TEES POLLUTION INQUIRY.

Table of Analysis of 9 Samples of Water by W. F. K. Stock, F.C.S., F.I.C., Public Analyst for Durham County.

Nature of Determination.	No. 1.	No. 1A.	No. 2.	No. 3.	No. 4.	No. 5.	No. 6.	No. 7.	No. 8.
Colour and appearance in 2 foot tube.	Light yellow, green, slightly turbid.	Green and exceedingly turbid.	Light yellow, green, slightly turbid.	Yellow, green, turbid.	Reddish brown, very turbid.	Reddish brown, very turbid.	Brownish green, slightly turbid.	Greenish, slightly milky.	Greenish yellow.
Smell at 100° Fahrenheit -	Weedy	Quite weedy	Quite weedy.	Quite weedy.	Earthy	Earthy	Weedy	Weedy	Slightly weedy.
Chlorine as chlorides -	·5950	·6300	·6300	·6650	·4550	·4550	·6300	·5950	·7000
Nitrogen as nitrates -	·0229	·0227	·0170	·0113	·0163	·0113	·0170	·0210	·0340
Ammonia -	·0014	·0042	·0028	·0021	·0056	·0021	·0070	trace	none
Albuminoid ammonia -	·0070	·0098	·0056	·0042	·0196	·0140	·0126	·0042	·0014
Oxygen absorbed in 15 min. at 80° Fahrenheit.	·0763	·1472	·0700	·0708	·4408	·3808	·0853	·1243	·0718
Oxygen absorbed in 4 hours at 80° Fahrenheit.	·1253	·2890	·1181	·1290	·7381	·6363	·1588	·2727	·1197
Total solid matter dried at 220° Fahrenheit.	12·6000	14·8400	11·4800	10·9200	14·5600	17·3600	10·9200	13·4400	10·0800
Suspended matter dried at 220° Fahrenheit.	—	5·6000	—	—	8·1200	10·9200	—	—	—
Results of Microscopical Examination.	Usual river organisms. Fibre resembling linen, starch, granules of wheat and barley. Broken hairs.	Usual river organisms. Fibre like linen, but less than in No. 1. No starch granules. Broken hairs.	Fibre as in No. 1. Numerous starch granules. River organisms as in Nos. 1 and 2.	Fibre as in No. 1. Coloured fibres of wool, animal hairs. Usual river organisms.	Fibre as in No. 1. Usual river organisms. Much mineral matter.	No fibre as in No. 1. Usual river organisms. Much mineral matter.	Linen, woollen, and cotton fibres. Fungus growths. River organisms. Broken starch granules. Exhausted dye stuffs.	Largely mineral matter. Decomposing vegetable matter. Usual river organisms.	Few moving organisms, very satisfactory.
Origin of Sample -	May 21, Intake, 7.30 a.m.	May 21, Intake, 6.30 p.m., flood.	May 21, below Gainford, 300 yards, 8.45 a.m.	May 21, above Staindrop Beck.	May 21, Half mile below Barnard Castle, flood.	May 21, Just below Lartington Beck; flood.	June 6, Half mile below Barnard Castle, 2.30 p.m., ordinary flow.	June 6, Just below Lartington Beck, 3.30 p.m., ordinary flow.	June 4, Laboratory Tap.

Figures give grains per gallon.

(5.) Report by the late PROFESSOR TIDY.

River Tees.

DEAR SIR.

November 29, 1887.

I SUBMIT to you,—

1. The general chemical analysis of the six samples collected by me from the River Tees on the occasion of my recent visit (November 8, 1887).
2. The results of the bacteriological examinations.
3. A table of analyses of the River Tees, made by me in June 1876, when the water was at summer level.

In order to inform myself fully in every detail connected with the River Tees, I have carefully read my notes of several inspections made in 1876. I have also in great detail endeavoured to form opinions as to the general nature of the bacteria found in the river.

I am of opinion that the Darlington Corporation have cause of action against Barnard Castle, who are committing an offence under section 3, of the Rivers Pollution Prevention Act, 1876, *provided* they can show to be polluted *thereby* (section 8) *within their district*. In other words, it would not be sufficient for the Corporation of Darlington to show that polluting matters are being discharged into the River Tees at Barnard Castle. But they must show that this polluting matter finds its way down the river and pollutes the river within the area of their authority.

From this point of view I have regarded the question. My opinion is that the matters discharged into the river at Barnard Castle do not so pollute the water of the Tees at Darlington, and that, therefore, any action taken by the Corporation under the Rivers Pollution Prevention Act of 1876 would prove a failure. The circumstance that the water at Darlington is rather better than the water of the river above Barnard Castle (and this, I submit, would prove the real test of the condition of things), is important.

—				Total Solids	Oxygen required.	Organic Carbon.	Chlorine.	Colonies.
Water above Barnard Castle	-	-	-	9.32	0.291	0.354	0.792	4.980
At Darlington	-	-	-	7.68	0.284	0.346	0.648	5.480

In connexion with this case I have also considered—

- (1.) The quantity of sewage probably discharged into the river at Barnard Castle.
- (2.) The probable dilution.
- (3.) The nature of the river bed.
- (4.) The rate of the river flow.
- (5.) The distance between Barnard Castle and Darlington.

I am of opinion that if the quantity of sewage discharged into the river at Barnard Castle was enormously greater than at present, the self-purifying action of the water would be amply sufficient to oxidize every trace of sewage impurity within a short distance of the outfall.

It is worthy of note that there are several sources of pollution between Barnard Castle and Darlington. Fully admitting that this fact constitutes in itself no excuse for Barnard Castle, I am convinced that it would complicate any proceedings taken by Darlington against Barnard Castle under section 3 of the Rivers Pollution Prevention Act of 1876.

Further, I am of opinion that Darlington would not be prejudiced (although the river is the source of its water supply) even if an outbreak of fever or cholera were to occur at Barnard Castle. I consider the water supplied to the town by the Corporation of Darlington, and drawn from the River Tees to be good and wholesome, an opinion confirmed by the statistics of deaths published by the Registrar-General, and which I have carefully examined since 1850.

Your obedient servant,

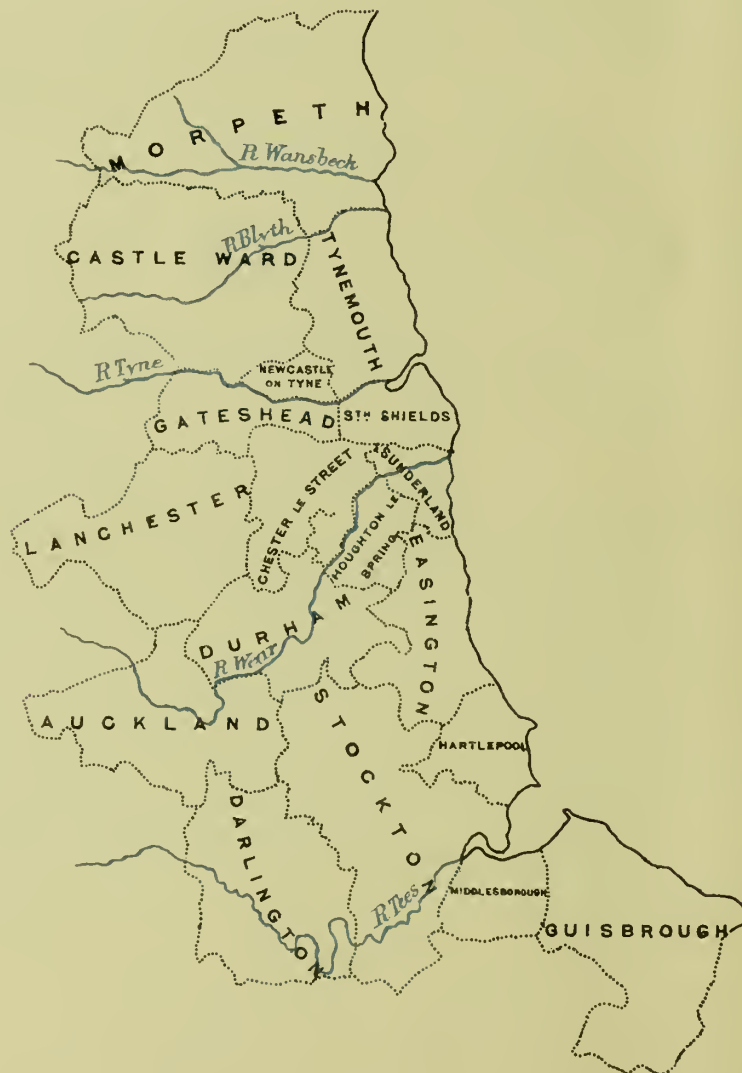
To the Town Clerk of Darlington.

C. M. TIDY, M.B.



PLATE A.

Showing topographically the Eighteen Registration Districts situate in Northumberland, Durham and North Yorkshire reported by the Registrar General to have suffered Collectively in 1890 an exceptionally high mortality from Enteric Fever.



ADDENDUM.

Notes by Dr. Barry upon the fatal incidence of Enteric Fever in Eighteen Registration Districts (comprising Sixty-nine Sanitary Districts) of Northumberland, Durham, and North Yorkshire, reported by the Registrar-General to have suffered collectively in 1890 in an exceptional degree from that disease.

In connexion with the Report that I have presented to the Board, in which I have dealt with the epidemic prevalence of Enteric Fever in the valley of the River Tees during 1890-91, it will, I think, be useful to consider a statement in the Registrar-General's Annual Report for 1890, (dated 26th November 1891), in which, after pointing out the general decline during recent years in the proportion of deaths from Enteric Fever throughout the country, he goes on to say that notwithstanding the "great decrease in Enteric Fever in the aggregate country, there are parts of it in which the disease appears to be still unduly prevalent. Such, for instance, is the tract of ground that runs along the east side of Northumberland and Durham, from Morpeth on the north to Middlesbrough and Guisbrough on the south. In this space, which comprises 18 Registration Districts, and had in the middle of 1890 a population estimated as 1,524,549, there were in that year no fewer than 601 deaths from Enteric Fever, giving a rate of 394 per 1,000,000 living, which was not only much more than twice the rate for all England and Wales, but was almost twice as high as the rate in the 28 great towns included in the Weekly Returns, and, indeed, higher than the rate in any one of these 28 towns, with the single exception of Salford. Moreover, examination of the Annual Reports for the three previous years 1887-8-9 shows that in a large proportion of these 18 districts there had been in those years also excessive Enteric Fever mortality."*

In view of these statements by the Registrar-General, and of further statistics to the same effect in his annual report for 1891,† the epidemic of Enteric Fever in the Tees Valley with which I have been dealing, might be thought of as part and parcel only of a widespread prevalence of this disease in the Northern Counties; of an epidemic, that is, referable to some common cause having a far more widely diffused range than Tees water can have had. Accordingly I have deemed it well to scrutinise the facts for the Registrar-General's eighteen Registration Districts from two points of view: namely, *degree* of Enteric Fever prevalence, and *time* of its occurrence, with the object of ascertaining what might have been the relations in 1890 of the epidemic in the Tees Valley and that wider prevalence of Enteric Fever indicated by the Registrar-General.

In Table A. a list is given of the eighteen Registration Districts referred to by the Registrar-General, and in Plate A. is shown the topographical relations of these districts. In the table will be found, as regards each district, the population as enumerated in the Census of 1881 and 1891 respectively; the number of deaths registered from Enteric Fever during each of the five years 1885-89; the mean annual number of deaths during the same period; and (in col. 10) the deaths registered from Enteric Fever during 1890. The rates of mortality from Enteric Fever per 10,000 of the population, estimated to the middle of each of the years 1885-90 are added, as well as the mean fever rate for the quinquennial period 1885-89. To aid the reader in the consideration of the facts I have in col. 18 placed the proportion for each district which the Enteric Fever death-rate in 1890 bore to the rate for the same district during the quinquennial period 1885-89, the quinquennial rate in each instance being taken as = 100. In col. 19 in like manner is shown the proportion which the 1890 district Enteric Fever rate bore in that year to the rate for the whole area under consideration.

* Fifty-third Annual Report of the Registrar-General of Births, Deaths, and Marriages in England (1890). [C.—6478] p. xii.

† Fifty-fourth Annual Report of the Registrar-General of Births, Deaths, and Marriages in England (1891). [C.—6841] p. xix.

TABLE A

Showing the NAMES and POPULATIONS of the EIGHTEEN REGISTRATION DISTRICTS situate in NORTHUMBERLAND, DURHAM, and NORTH YORKSHIRE, reported by the REGISTRAR-GENERAL to have suffered COLLECTIVELY IN 1890 an exceptionally High Rate of Mortality from ENTERIC FEVER, together with the NUMBER of DEATHS from ENTERIC FEVER registered in each District during the SIX YEARS, 1885-90, and the RATES OF MORTALITY from that Disease per 10,000 of the Population estimated to the Middle of each Year.

Registration Districts.	Population.			Deaths from Enteric Fever registered during Years						Mean Annual Number of Deaths registered from Enteric Fever during 5 years, 1885-89.	Deaths from Enteric Fever registered during 1890.	Annual Death-rates from Enteric Fever per 10,000 of the Population, estimated to the Middle of the Year					Comparative Mortality from Enteric Fever in 1890 and in 5 Years, 1885-89. Means of 5 Years in each Case = 100.	Comparative Mortality from Enteric Fever in 1890. Mean of whole District = 100.	
	Census, 1881.	Census, 1891.		1885.	1886.	1887.	1888.	1889.	1885.			1886.	1887.	1888.	1889.	Mean of 5 Years, 1885-89.			1890.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	
GUISBROUGH	43,126	39,986	2	7	12	11	6	7.6	12	0.48	4.69	2.92	2.69	4.48	4.85	2.98	464	76	
MIDDLESBROUGH	89,910	121,213	42	35	24	24	30	31.0	130	4.12	3.33	2.22	2.15	2.61	2.86	10.98	384	279	
DARLINGTON	47,676	49,512	5	13	6	6	7	7.4	21	1.03	2.67	1.23	1.22	1.42	1.32	4.26	280	108	
STOCKTON	68,252	81,251	16	16	26	11	13	16.4	66	2.18	2.14	3.42	1.42	1.65	2.16	8.24	382	209	
HARTLEPOOL	48,613	66,667	16	9	9	6	15	11.0	24	2.88	4.57	2.99	2.51	5.45	2.81	3.69	198	94	
AUCKLAND	83,572	88,998	15	11	26	22	48	24.4	52	1.75	4.27	2.88	2.53	3.59	2.43	5.87	209	149	
Lanchester	57,821	65,464	11	8	18	16	23	15.2	20	4.80	4.30	2.22	3.60	4.46	4.72	3.08	127	78	
Durham	64,324	69,592	11	13	15	9	10	11.6	9	1.65	4.94	2.22	3.60	4.46	4.72	1.30	76	33	
Easington	41,098	45,826	16	19	27	16	20	19.6	14	3.72	4.37	6.14	3.60	4.45	4.46	3.05	69	78	
Houghton-le-Spring	34,145	37,921	9	11	19	17	37	18.6	10	2.52	3.05	5.21	4.62	9.94	5.10	2.66	52	68	
Chester-le-Street	43,792	50,594	14	6	9	13	10	10.4	15	3.01	4.27	1.88	2.67	2.03	2.47	3.00	138	76	
Sunderland	139,193	158,642	23	17	38	27	39	28.8	42	1.56	4.14	2.52	1.76	2.52	2.47	2.67	140	68	
South Shields	103,294	141,493	9	19	13	15	17	14.6	41	0.76	1.56	1.03	1.16	1.27	1.16	4.35	256	75	
Gateshead	105,410	131,280	33	29	24	8	19	22.6	56	2.85	2.45	1.99	0.65	4.51	1.87	4.35	233	110	
Newcastle-on-Tyne	150,252	196,839	58	35	45	24	20	36.4	21	3.44	2.02	2.53	1.31	4.06	2.05	4.09	53	28	
Tynemouth	114,197	133,219	13	33	26	11	32	23.0	42	1.07	2.67	2.07	0.86	2.47	1.83	3.19	474	81	
Castleward	19,720	24,316	6	6	10	6	6	6.8	13	2.78	2.73	4.45	2.61	2.56	3.03	5.43	179	138	
Morpeth	36,085	42,551	22	8	7	4	16	11.4	13	5.68	2.03	1.75	0.98	3.87	2.85	3.10	109	79	
Totals, 18	1,290,480	1,545,364	321	295	354	246	368	316.3	601	2.31	2.08	2.45	1.67	2.46	2.19	3.94	480	100	
			1.75	4.84	1.85	1.72	1.76	1.78	1.79										

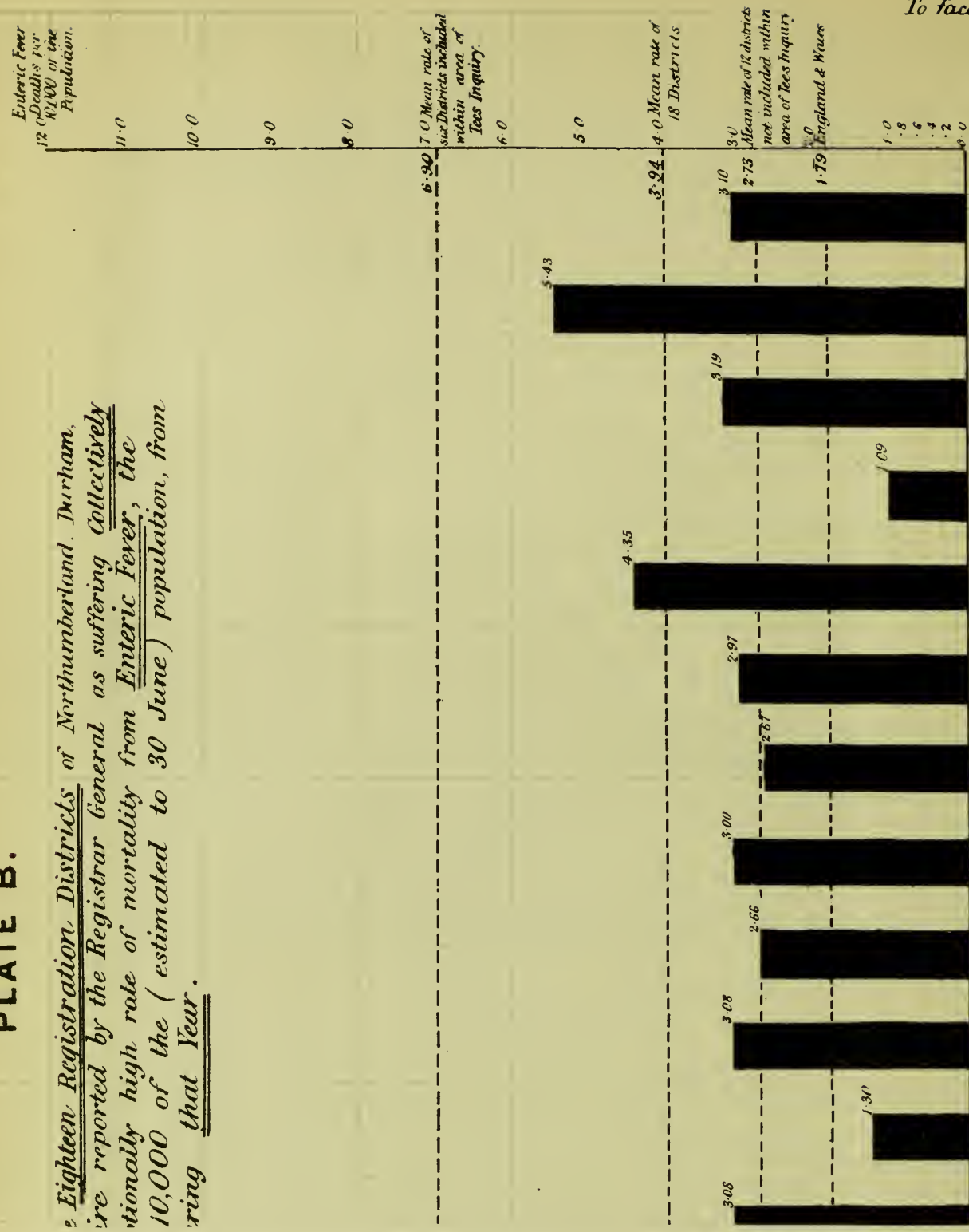
England and Wales.

England and Wales.



PLATE B.

Eighteen Registration Districts of Northumberland, Durham,
are reported by the Registrar General as suffering Collectively
tionally high rate of mortality from Enteric Fever, the
10,000 of the (estimated to 30 June) population, from
ring that Year.



To face page 139.

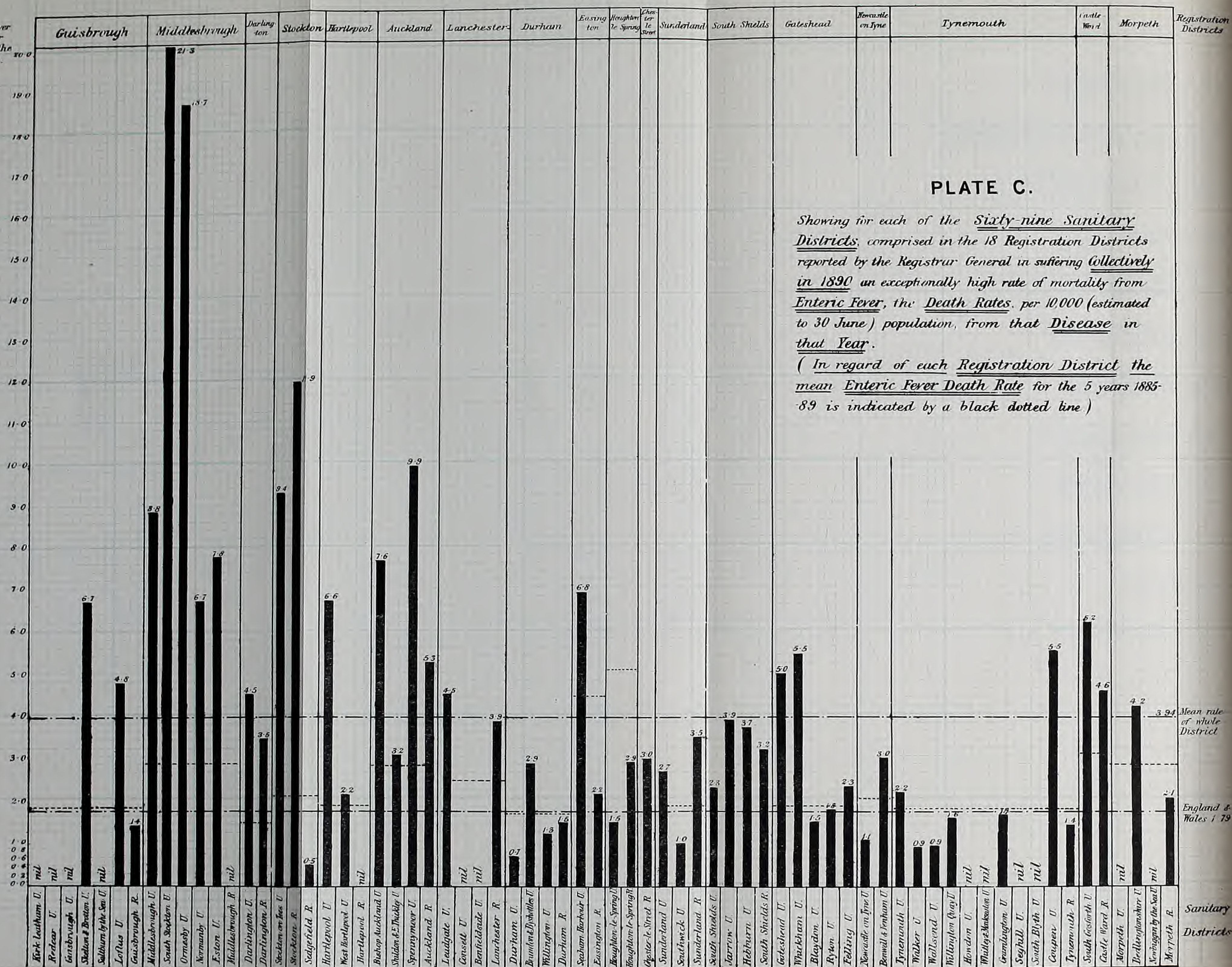
Showing the NAMES a
GENERAL to have
FEVER registered
Middle of each Y

Registration Distric

1.
GUISBROUGH
MIDDLEBROUGH
DARLINGTON
STOCKTON
HARTLEPOOL
AUCKLAND
Lanchester
Durham
Easington
Houghton-le-Spring
Chester-le-Street
Sunderland
South Shields
Gateshead
Newcastle-on-Tyne
Tynemouth
Castleward
Morpeth

Totals, 18

Enteric Fever
Deaths per
10,000 of the
Population.



DIFFERENT INCIDENCE in DEGREE and in TIME of ENTERIC FEVER MORTALITY on the EIGHTEEN
REGISTRATION DISTRICTS of the REGISTRAR-GENERAL.

Table A. shows, with reference to the period (1885-89) antecedent to 1890, that among the eighteen Registration Districts of the Registrar-General, those with which my Tees Report has been concerned by no means suffered most severely from Enteric Fever. Thus, for Guisbrough, Darlington, Stockton, and Hartlepool (all of them included in the area of my inquiry), the mean Enteric Fever rate for the five years in question was in each instance considerably below that of the eighteen districts of the Registrar-General as a whole. And, on the other hand, the table shows that in 1890, Registration Districts within the area of my Tees Inquiry suffered disproportionately to other districts. Thus, in 1890, Guisbrough, Middlesbrough, Darlington, Stockton, Hartlepool, and Auckland, having in 1891 less than one-third the population of the Registrar-General's area, furnished 305 out of the 601 Enteric Fever deaths in the eighteen Districts of the Registrar-General. Rateably to population these figures give for the six districts in question (estimated population to middle of 1890, 441,988), 6.90 Enteric Fever deaths per 10,000; whereas in the other 12 districts of the Registrar-General (estimated population to the middle of 1890, 1,081,677) the Enteric Fever rate was not more than 2.73 per 10,000. These facts are illustrated by Plate B.

There can be no question, then, as regards *degree* of Enteric Fever prevalence, that in 1885-89 Registration Districts dealt with by me in my Tees Report suffered on the whole less, whereas in 1890 they suffered very much more, than other registration districts situate in Durham and Northumberland comprised in the Registrar-General's area of excessive fever mortality.

Subdividing now the eighteen Registration Districts of the Registrar-General into their component sanitary districts, with a view of ascertaining the chief *localities* of Enteric Fever prevalence in 1890 in the wide area of the Registrar-General, and the *time* of its occurrence, I have constructed Table B. on the same lines as Table A., and I add Plate C., which illustrates graphically the 1890 Enteric Fever death-rates of each of the sixty-nine sanitary districts in question. Further details as to population, &c. are given in full in the tables annexed to this memorandum.

TABLE B.

SHOWING for each of the SIXTY-NINE SANITARY DISTRICTS comprised in the EIGHTEEN REGISTRATION DISTRICTS reported by the REGISTRAR-GENERAL as suffering COLLECTIVELY in 1890 an exceptionally HIGH RATE OF MORTALITY from ENTERIC FEVER, the POPULATION enumerated in 1881 and 1891, the DEATHS from ENTERIC FEVER registered in EACH DISTRICT during each of the YEARS 1885-90, and the DEATH-RATES per 10,000 of the POPULATION (estimated to middle of Year) from that DISEASE in EACH YEAR.

Registration District.	Sanitary District.	Population.		Deaths from Enteric Fever registered during Years						Mean Annual Number of Deaths registered from Enteric Fever during 5 Years 1885-1889.	Annual Death-rate from Enteric Fever per 10,000 of the Population, estimated to the middle of the Year.						Comparative Mortality in 1890, and in previous 5 Years, mean of 5 Years in each taken as = 100.	Comparative Mortality in 1890 from Enteric Fever, mean for whole district taken as = 100.	Extracts from Reports of Medical Officers of Health as to Prevalence of Enteric Fever during 1890.	
		Census 1881.	Census 1891.	1885.	1886.	1887.	1888.	1889.	Mean of 5 Years, 1885-89.											
									1885.		1886.	1887.	1888.	1889.	17.	18.				
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.
GUISBROUGH	Kirkcatham, U.	3,898	4,209	—	—	1	—	—	0.2	—	—	—	2.44	—	—	0.49	—	—	—	—
	Redcar, U.	2,458	2,818	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Guisebrough, U.	6,616	5,623	2	1	2	2	—	1.4	—	3.24	4.64	3.35	3.41	—	2.34	—	—	—	—
	*Skelton and Brotton, U.	13,558	11,842	1	—	4	6	1	2.4	8	0.78	—	3.21	4.88	0.82	4.93	6.69	347	170	—
	Saltburn-by-the-Sea, U.	1,646	2,232	1	—	—	1	—	0.4	—	5.35	—	—	4.87	—	2.00	—	—	—	—
MIDDLESBROUGH	Lofus, U.	6,609	6,208	—	—	2	1	2	1.0	3	—	—	3.13	4.58	3.18	4.57	4.81	306	122	—
	Guisebrough, R.	8,251	7,074	1	4	1	1	1	1.6	1	4.30	5.26	4.34	4.36	4.38	2.74	4.40	65	36	—
	Middlesbrough, U.	55,934	75,516	18	20	14	12	19	16.6	65	2.83	3.06	2.08	1.73	2.65	2.46	8.81	358	224	—
	South Stockton, U.	10,665	15,476	12	3	2	5	7	5.8	32	9.61	2.31	4.40	3.65	4.83	4.30	21.28	495	540	—
	Ormesby, U.	7,719	8,629	2	1	2	2	3	2.0	16	2.47	4.22	2.42	2.39	3.55	2.42	118.70	774	475	—
DARLINGTON	*Normanby, U.	7,714	9,128	—	6	—	2	—	1.6	6	—	7.25	—	2.30	—	4.87	6.67	357	169	—
	*Eston, U.	6,297	10,685	2	1	—	2	—	1.0	8	2.54	4.30	—	2.16	—	4.74	7.79	684	198	—
	*Middlesbrough, R.	1,581	1,769	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	Darlington, U.	33,104	38,060	3	12	3	5	—	5.6	17	0.83	3.28	0.81	4.34	4.33	4.53	4.50	296	114	—
	Darlington, R.	12,572	11,452	1	1	2	1	2	1.4	4	0.83	0.84	4.69	0.85	4.72	4.18	3.47	294	88	—
STOCKTON	*Stockton-on-Tees, U.	41,660	49,731	7	10	16	3	9	9.0	46	4.56	2.19	3.44	0.63	4.87	4.93	9.38	487	238	—
	*Stockton, R.	9,489	11,961	1	2	1	1	3	1.6	14	0.96	4.87	0.91	0.89	2.61	4.46	11.90	815	302	—
	Sedgefield, R.	17,103	19,559	5	2	4	6	2	3.8	1	2.76	4.09	2.15	3.18	4.05	2.11	0.52	25	43	—
	*Hartlepool, U.	16,998	21,321	5	6	7	4	11	6.6	14	2.66	3.12	3.55	1.98	5.33	3.35	6.63	198	168	—
	*West Hartlepool, U.	29,448	42,492	?	?	4	1	5	?	9	?	?	4.08	0.26	4.25	?	2.18	?	55	—
HARTLEPOOL	Hartlepool, R.	2,167	2,654	—	1	—	—	—	0.2	—	—	4.15	—	—	—	0.81	—	—	—	—
	Bishop Auckland, U.	10,007	10,527	?	?	?	?	?	?	8	?	?	?	?	?	?	7.63	?	—	—
	Shildon and East Thickley, U.	8,704	9,537	?	?	1	—	7	?	3	?	?	4.08	—	7.45	?	3.47	?	80	—
	Spennymoor, U.	5,917	6,041	?	?	2	4	5	?	6	?	?	3.34	6.67	8.30	?	9.95	?	252	—
	Auckland, R.	58,854	62,803	9	18	8	20	31	17.2	33	4.49	2.95	4.31	3.24	4.98	2.80	5.28	189	134	—

* The boundaries of the districts marked thus have been changed since the date of the Census 1881. In all such cases the enumerated population in 1881, as well as in 1891, relates to the new area.

TABLE B.—continued.

Registration District.	Sanitary District.	Population.		Deaths from Enteric Fever registered during Years					Mean Annual Number of Deaths registered from Enteric Fever during 5 Years 1885-1889.	Deaths from Enteric Fever registered during 1890.	Annual Death-rate from Enteric Fever per 10,000 of the Population, estimated to the middle of the year.					Comparative Mortality in 1890, and in previous 5 Years, mean of 5 Years in each taken as = 100.	Comparative Mortality in 1890 from Enteric Fever, mean for whole district taken to = 100.	Extracts from Reports of Medical Officers of Health as to Prevalence of Enteric Fever during 1890.
				1885.	1886.	1887.	1888.	1889.										
				5.	6.	7.	8.	9.			12.	13.	14.	15.	16.	17.	18.	
1.	2.	3.	4.						10.	11.						19.	20.	21.
LANCHESTER	*Leadgate, U.	4,274	4,458	?	?	?	?	?	?	2	?	?	?	?	?	?	—	No exceptional prevalence of Enteric Fever.
	Consett, U.	7,163	8,175	?	?	2	1	1	?	—	?	?	2·57	4·22	4·23	?	—	
	Benfieldside, U.	5,703	5,259	—	1	—	—	1	0·4	—	—	4·70	—	—	4·63	0·66	—	
	*Lancaster, R.	40,681	46,574	5	7	14	17	17	12·0	18	4·46	4·64	3·16	3·79	3·74	2·71	3·90	99
DURHAM	Durham, U.	14,982	14,863	1	6	2	1	2	2·4	1	0·67	4·03	4·34	0·67	4·34	4·64	0·67	47
	Brandon and Bishopton, U.	10,850	14,239	2	1	5	2	1	2·2	4	4·64	0·80	3·89	4·51	0·74	4·74	2·87	73
	*Willington, U.	7,238	7,804	1	4	1	—	1	1·4	1	4·20	5·15	4·20	—	4·28	4·80	4·28	32
	*Durham, R.	31,304	32,686	7	5	7	6	5	6·0	5	3·20	4·66	2·48	1·86	4·54	4·87	4·53	30
EASINGTON	Seaham Harbour, U.	7,714	8,856	2	9	6	2	7	5·2	6	2·47	18·85	7·13	2·35	8·10	6·18	6·85	175
	Easington, R.	33,384	36,970	14	10	21	14	13	14·4	8	4·02	2·84	5·90	3·90	3·58	4·04	2·48	55
HOUGHTON-LE-SPRING	Houghton-le-Spring, U.	6,041	6,476	—	3	1	1	—	1·0	1	—	4·80	4·50	4·37	—	4·59	4·55	39
	Houghton-le-Spring, R.	28,104	31,445	9	8	18	16	37	17·6	9	3·06	2·69	5·97	5·25	12·00	5·84	2·89	73
CHESTER-LE-STREET	Chester-le-Street, R.	43,742	50,594	14	6	9	13	10	10·4	15	3·01	4·27	4·88	2·67	2·63	2·47	3·00	76
	Sunderland, U.	116,542	130,921	16	13	30	20	28	21·4	35	4·42	4·42	2·52	4·64	2·24	4·80	2·73	69
SUNDERLAND	*Southwick, U.	8,103	10,226	2	—	3	2	2	1·8	1	2·24	—	3·20	2·09	2·04	4·92	4·00	23
	*Sunderland, R.	14,548	17,495	3	3	4	4	3	3·4	6	4·90	4·87	2·43	2·40	4·77	2·68	3·48	29
	South Shields, U.	56,875	78,431	5	11	8	10	8	8·4	18	0·70	4·64	4·43	4·39	4·08	4·24	2·35	60
SOUTH SHIELDS	*Jarrow, U.	25,483	33,682	2	2	4	2	1	2·2	13	0·90	0·68	4·33	0·64	0·34	0·72	3·94	100
	Hebburn, U.	11,802	16,638	—	1	—	2	7	2·0	6	—	0·71	—	1·32	4·47	4·37	3·70	94
	*South Shields, R.	9,134	12,7	—	4	1	2	1	1·6	4	—	3·68	0·89	1·72	0·83	4·42	3·22	62

* The boundaries of the districts marked thus have been changed since the date of the Census 1881. In all such cases the enumerated population in 1881, as well as in 1891, relates to the new area.

TABLE B.—continued.

Registration District.	Sanitary District.	Population.		Deaths from Enteric Fever registered during Years					Mean Annual Number of Deaths registered from Enteric Fever during 5 Years 1885-1889.	Deaths from Enteric Fever registered during 1890.	Annual Death-rate from Enteric Fever per 10,000 of the Population, estimated to the middle of the Year.					Comparative Mortality in 1890, and in previous 5 Years, mean of each taken as = 100.	Extracts from Report of Medical Officers of Health as to Prevalence of Enteric Fever during 1890.			
		Census 1881.	Census 1891.	1885.	1886.	1887.	1888.	1889.			1885.	1886.	1887.	1888.	1889.			Mean of 5 Years, 1885-89.		
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.
GATESHEAD	Gateshead, U.	65,803	85,700	10	13	16	1	8	9.6	42	1.36	1.72	2.06	0.13	0.98	1.24	5.00	403	127	Enteric Fever epidemic from June to September. Attributed by Medical Officer of Health to contaminated milk.
	Whickham, U.	7,976	9,174	1	2	1	2	4	2.0	5	1.18	2.33	1.45	2.26	4.47	2.30	5.51	240	140	Enteric Fever prevalent in September and October at High Row and Marley Hall. No cause assigned.
	Blaydon, U.	10,687	13,371	17	1	—	5	2	5.0	2	14.47	0.88	—	3.98	1.55	4.07	1.52	37	39	Enteric Fever not specially prevalent.
	Ryton, U.	4,568	5,553	—	1	—	—	2	0.6	1	—	1.98	—	—	3.74	1.16	1.83	158	46	"
	Felling, U.	16,376	17,473	4	9	4	—	2	3.8	4	2.38	5.32	2.35	—	1.16	2.23	2.30	103	58	The deaths from Enteric Fever occurred in May.
NEWCASTLE-ON-TYNE	Newcastle-on-Tyne, U.	145,359	186,345	56	34	42	22	16	34.2	21	3.47	2.05	2.48	1.32	0.90	2.01	1.15	57	29	Enteric Fever much less prevalent than usual.
	Benwell and Fenham, U.	4,893	10,515	2	—	4	—	1	1.6	3	2.95	—	5.07	—	1.19	2.02	3.02	149	77	Scattered cases only. No prevalence.
	Tynemouth, U.	44,118	46,267	3	3	4	2	4	3.2	10	0.67	0.66	0.88	0.44	0.87	0.70	2.17	310	55	Most of the cases stated to have been imported.
	Walker, U.	9,527	11,341	3	2	1	2	4	2.4	1	2.92	1.92	0.94	1.85	3.64	2.26	0.89	39	23	No prevalence of Enteric Fever.
	Wallsend, U.	6,351	11,620	—	2	1	—	—	0.6	1	—	2.29	1.08	—	—	0.65	0.90	138	23	"
TYNEMOUTH	Willington Quay, U.	4,974	6,340	1	—	1	—	1	0.6	1	1.81	—	1.73	—	1.65	1.63	1.64	156	41	"
	Howdon, U.	1,099	962	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	"
	Whitley and Monk-seaton, U.	1,800	3,008	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	"
	Crumlington, U.	5,744	5,967	—	1	4	—	2	1.4	1	—	1.71	6.80	—	3.38	2.38	1.68	71	43	"
	Seghill, U.	2,131	2,269	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	"
CASTLE WARD	South Elyth, U.	2,831	3,626	1	1	—	—	—	0.4	—	3.18	3.11	—	—	—	1.21	—	—	—	"
	Cowpen, U.	10,003	12,982	1	21	12	3	7	8.8	7	0.89	18.30	10.20	2.48	5.65	7.47	5.50	74	140	Enteric Fever epidemic. Epidemic 1890 associated with contaminated water supply. No special prevalence of Enteric Fever.
	Tynemouth, R.	25,619	28,837	5	4	2	2	2	3.0	4	1.86	1.47	0.72	0.72	0.71	1.08	1.40	130	36	Outbreaks of Enteric Fever in Spring and Autumn. Both traced to milk from one dairy.
	South Gosforth, U.	4,126	6,674	—	—	3	2	2	1.4	4	—	—	5.39	3.42	3.26	2.51	6.21	248	158	Enteric Fever epidemic in Newburn Parish in Limington District. Many cases imported from Tyneside towns.
	Castle Ward, R.	15,584	17,642	7	4	6	3	3	4.6	8	4.26	2.41	5.56	1.76	1.74	2.73	4.58	168	116	No special prevalence of Enteric Fever.
MOREETH	Moreeth, U.	4,968	5,219	—	—	—	2	1	0.6	—	—	—	—	3.88	1.94	1.17	—	—	—	"
	Bedlingtonshire, U.	14,510	16,996	9	2	1	1	10	4.6	7	5.78	1.27	0.62	0.62	6.05	2.87	4.23	147	107	Enteric Fever prevalent in 1889. Some of the deaths in 1890 due to this.
	Newbiggin-by-the-Sea, U.	1,388	1,579	—	—	1	—	—	0.2	—	—	—	6.67	—	—	1.33	—	—	—	No prevalence of Enteric Fever.
	Moreeth, R.	15,219	18,767	11	7	5	1	4	5.6	4	6.62	4.12	2.89	0.56	2.21	3.26	2.17	67	55	"
	Total Population, 18 Registration and 69 Sanitary Districts	1,290,480	1,545,364									2.31	2.08	2.45	1.67	2.16	2.19	480	169	

* The boundaries of the districts marked thus have been changed since the date of the Census 1881. In all such cases the enumerated population in 1881, as well as in 1891, relates to the new area.

PLATE D.

Showing topographically the
SIXTY NINE SANITARY DISTRICTS

comprised in the 18 Registration Districts reported by the Registrar General as suffering COLLECTIVELY IN 1890 an exceptionally high rate of mortality from ENTERIC FEVER

Scale - 4 miles to 1 Inch.

Names in thick type - Registration Districts

" " Italics - Sanitary Districts

(U. Urban, R. Rural.)

Populations (Roman Figures) in each instance those at Census 1891.

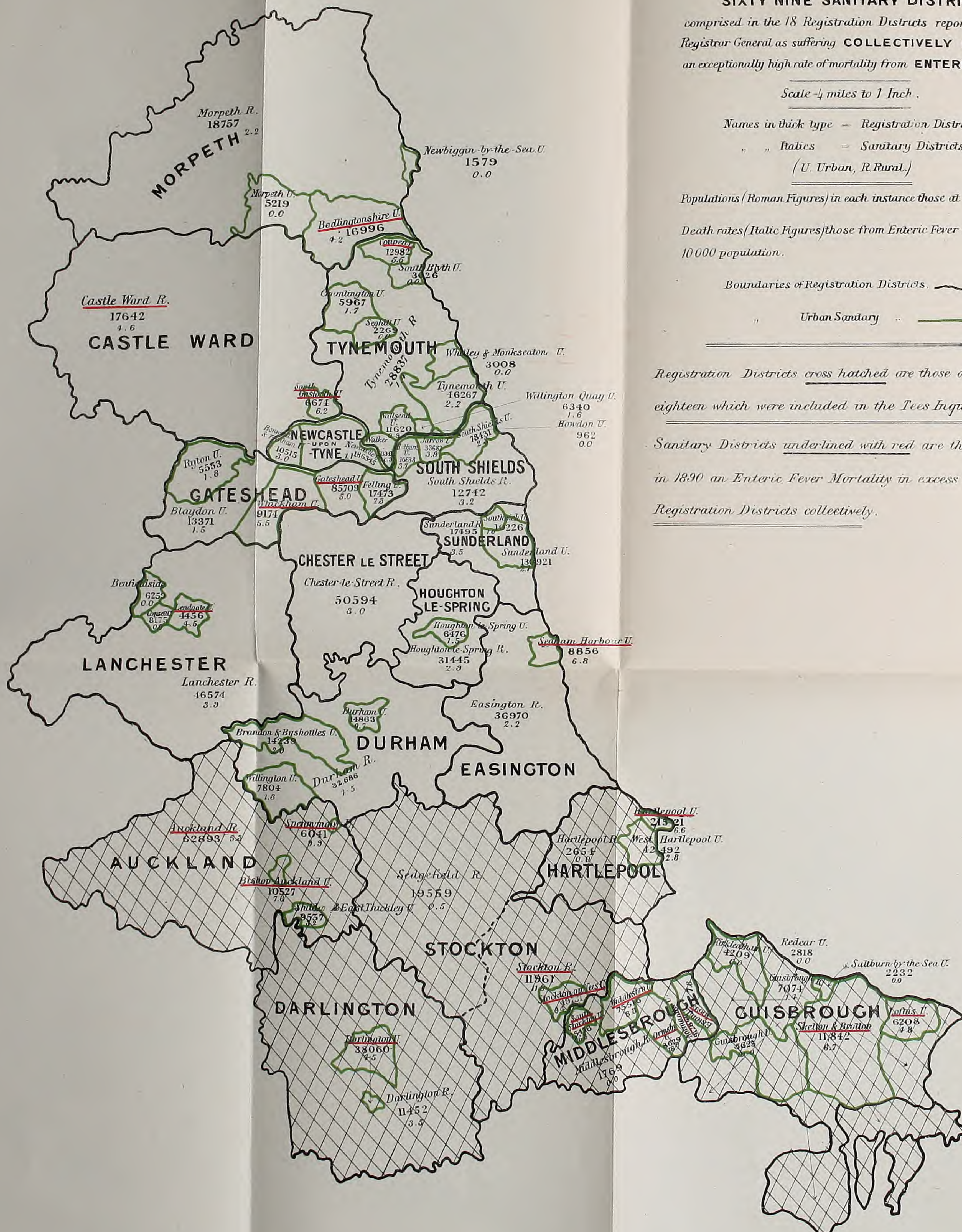
Death rates (Italic Figures) those from Enteric Fever in 1890 per 10 000 population.

Boundaries of Registration Districts. ———

Urban Sanitary ———

Registration Districts cross hatched are those of the above eighteen which were included in the Tees Inquiry.

Sanitary Districts underlined with red are those suffering in 1890 an Enteric Fever Mortality in excess of the Eighteen Registration Districts collectively.



The sub-division effected in Table B. and Plate C. of the 18 Registration Districts into 69 Sanitary Districts serves to illustrate at one and the same time the Registrar-General's thesis and my own. Thus, from the Registrar-General's view point, it shows in 1890 rates of Enteric Fever mortality above that of England and Wales in above 50 per cent. of the 69 Sanitary Districts; and this whether the Districts are taken collectively or are dealt with in separate groups;—namely, sanitary districts within and sanitary districts outside of the area of the Tees Inquiry. But, on the other hand, and from my own view point, this sub-division emphasizes *as regards Sanitary Districts with rates above that of England and Wales*, a vastly greater degree of fever in Sanitary Districts within the area of the Tees Inquiry than in other Sanitary districts of the Fever area of the Registrar-General. The facts to be got from Table B. and Plate C. may conveniently be expressed in a subsidiary table as follows:—

Sanitary Districts.	Sanitary Districts (69) suffering in 1890 Enteric Fever Rates:—			
	<i>Below that of England and Wales (1·79).</i>	<i>Above that of England and Wales, but below that of Registrar-General's 18 Districts.</i>	<i>Above that of Registrar-General's 18 Districts (3·94).</i>	<i>More than double that of the Registrar-General's 18 Districts.</i>
25 within area of Tees Inquiry - -	8 (32·0 %)	3 (12·0 %)	14 (56·0 %)	6
44 outside that area - - -	20 (45·4 %)	16 (36·4 %)	8 (18·2 %)	NIL

The subsidiary table shows that of Sanitary Districts within the Tees area, not less than 56 per cent., whereas of Sanitary Districts outside that area only 18·2 per cent. suffered in 1890, an Enteric Fever rate in excess of that of the Registrar-General's 18 Registration Districts collectively. And, further, it shows that of Sanitary Districts suffering in 1890 in excess of the 18 Registration Districts collectively, there were within the area of my Tees Inquiry above 40 per cent. having a rate more than double that (3·94) of the 18 Registration Districts, whereas in the remainder of the Registrar-General's fever area, the highest rate of any district did not reach 7·0 per 10,000 of its population. Such Sanitary Districts, therefore, within the Tees area as suffered epidemic Enteric Fever in 1890, suffered outrageously in comparison with Sanitary Districts in the remainder of the fever area of the Registrar-General.

So much for differing degrees in 1890 of Enteric Fever mortality in the 69 Sanitary Districts comprised in the 18 Registration Districts of the Registrar-General. All that remains for consideration is the topographical distribution of exceptional Enteric Fever mortality, and its incidence on the Sanitary Districts according to season of the year.

As regards distribution of this mortality, Plate D., illustrating the topographical relations of the 69 Sanitary Districts, suffices to demonstrate what has already seemed to be implied in the facts adduced, namely, that there were indeed in 1890 two centres, so to speak, of extra mortality from Enteric Fever within the region defined by the Registrar-General. One such Enteric Fever area, characterised by comparatively moderate rates in the Sanitary Districts affected by the fever, is to be found occupying the northern portion of the region in question, the other, characterised by extravagant rates in the Sanitary Districts chiefly affected, is seen to be located in the southern or Tees portion of that region. And it will be observed that in the interval between these fever centres, Sanitary Districts over a large tract of country were, with few exceptions, little, if at all, subject in 1890 to Enteric Fever.

With reference to the *season of the year* in which, during 1890, Enteric Fever was most active, this differed too, in the northern and southern sections of the Registrar-General's Fever area. As regards the section of that area, which has been dealt with in my Tees Report, it has already been seen that the main incidence of the Enteric Fever mortality in 1890 was in the last quarter of the year.* It has now to be shown that in the Sanitary Districts chiefly implicated outside the area of my Tees inquiry, the season of exceptional Enteric Fever mortality did not always coincide with that observed by me in the Tees Valley. Thus, of Sanitary Districts in Northumberland and Durham, having in 1890 an Enteric Fever death-rate in excess of that of the 18 Registration Districts—

Bedlingtonshire Urban (rate 4·2), suffered most of its Fever of 1890 in the early months of the year, in continuation of an epidemic which had commenced in 1889.

South Gosforth Urban (rate 6·2), suffered two outbreaks of Enteric Fever in 1890, one in spring and the other in the autumn; both outbreaks being traced by the Medical Officer of Health to the use of contaminated milk from a particular dairy.

Cowpen Urban (rate 5·5), suffered in 1890 from excess of Enteric Fever more or less throughout the year. This excessive incidence of Enteric Fever being simply a continuation of a prevalence which commenced as far back as 1886—the disease being here associated with a specifically contaminated local water supply.

* The exceptions were South Stockton and Ormesby Urban Sanitary Districts which suffered more than half their fever mortality in the first six months of the year; and Bishop Auckland and Spennymoor Urban Sanitary Districts, the former of which suffered half, and the latter the whole of its 1890 fever mortality in the first half of that year.

Gateshead Urban (rate 5·0), suffered from epidemic Enteric Fever in 1890 during the period from June to September, the epidemic in this district being attributed to the use of specifically contaminated milk.

Jarrow Urban (rate 3·9), suffered from epidemic Enteric Fever in 1890 from January to May.

To sum up :—

There has been found, as indicated by the Registrar-General, a greater mortality during the six years 1885-90, from Enteric Fever in a certain area of the North of England, than in England and Wales collectively.

During the first five years of this period, the excess of Enteric Fever mortality in question chiefly affected the northern section of the Registrar-General's area. In 1890, it was most conspicuous in the southern section of that area, more especially in Sanitary Districts grouped in and about the Tees Valley.

There has been maintained therefore during several years in the area designated by the Registrar-General a material cause of Enteric Fever which has found opportunity for its dissemination on a notable scale now in one, now in another section of that area; and which in the autumn of 1890 obtained special facility for such dissemination in districts within and near to the Tees Valley.

What were the conditions which, as agents of dissemination, gave during the autumn of 1890, extravagant effect in the Tees Valley and neighbourhood to the material cause of Enteric Fever demonstrated by the Registrar-General to have been long established in this part of the North of England, has been sufficiently indicated in my report to which this paper is an addendum.

FRED. W. BARRY.

December, 1892.

DETAILED TABLES.

SHOWING for each SANITARY DISTRICT comprised within the EIGHTEEN REGISTRATION DISTRICTS of NORTHUMBERLAND, DURHAM, and NORTH YORKSHIRE, reported by the REGISTRAR-GENERAL as suffering collectively in 1890 an exceptionally HIGH RATE of MORTALITY from ENTERIC FEVER the estimated POPULATION, DEATHS from ENTERIC FEVER, and RATES per 10,000 of the POPULATION which obtained during each of the Years 1888-91, and during the QUINQUENNIAL PERIOD of 1885-89.

GUISBROUGH REGISTRATION DISTRICT.																								
Year.	Kirkcaldham, U.S.D.			Redcar, U.S.D.			Guisbrough, U.S.D.			Skelton and Brotton, U.S.D.			Saltburn-by-the-Sea, U.S.D.			Loftus, U.S.D.			Guisbrough, R.S.D.					
	Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.				
		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.	Registered.	Rate per 10,000 Population.	
1885	-	-	-	4,027	-	0'00	2,605	-	0'00	6,174	2	3'24	12,800	1	0'78	1,873	1	5'35	6,485	-	0'00	7,719	1	1'30
1886	-	-	-	4,058	-	0'00	2,640	-	0'00	6,074	1	1'64	12,628	-	0'00	1,931	-	0'00	6,436	-	0'00	7,599	4	5'26
1887	-	-	-	4,089	1	2'44	2,677	-	0'00	5,976	2	3'35	12,458	4	3'24	1,991	-	0'00	6,387	2	3'13	7,481	1	1'34
1888	-	-	-	4,121	-	0'00	2,714	-	0'00	5,880	2	3'44	12,291	6	4'88	2,032	1	4'87	6,339	1	1'58	7,364	1	1'36
1889	-	-	-	4,152	-	0'00	2,751	-	0'00	5,785	-	0'00	12,125	1	0'82	2,116	-	0'00	6,291	2	3'18	7,250	1	1'38
Mean of five years, 1885-9	-	-	-	4,089	0'2	0'49	2,677	-	0'00	5,978	1'4	2'34	12,480	2'4	1'93	1,992	0'4	2'00	6,387	1	1'57	7,482	1'6	2'14
1890	-	-	-	4,184	-	0'00	2,789	-	0'00	5,692	-	0'00	11,932	8	6'69	2,181	-	0'00	6,243	3	4'84	7,131	1	1'40
1891	-	-	-	4,217	-	0'00	2,827	-	0'00	5,600	-	0'00	11,802	2	1'69	2,249	-	0'00	6,196	-	0'00	7,026	1	1'42

MIDDLESBROUGH REGISTRATION DISTRICT.																					
Year.	Middlesbrough, U.S.D.			South Stockton, U.S.D.			Ormesby, U.S.D.			Normanby, U.S.D.			Eston, U.S.D.			Middlesbrough, R.S.D.					
	Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.				
		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.	Registered.	Rate per 10,000 Population.	
1885	-	-	-	65,544	18	2'82	12,493	12	9'61	8,112	2	2'47	8,285	-	0'00	7,886	2	2'54	1,658	-	0'00
1886	-	-	-	65,481	20	3'06	12,967	3	2'31	8,184	1	1'22	8,426	6	7'25	8,315	1	1'20	1,677	-	0'00
1887	-	-	-	67,476	14	2'08	13,459	2	1'49	8,275	2	2'42	8,569	-	0'00	8,788	-	0'00	1,696	-	0'00
1888	-	-	-	69,532	12	1'73	13,969	5	3'65	8,368	2	2'39	8,715	2	2'30	9,245	2	2'16	1,715	-	0'00
1889	-	-	-	71,651	19	2'65	14,499	7	4'83	8,432	3	3'55	8,863	-	0'00	9,748	-	0'00	1,734	-	0'00
Mean of five years, 1885-9	-	-	-	67,533	16'6	2'46	13,477	5'8	4'36	8,280	2	2'42	8,574	1'6	1'87	8,792	1	1'14	1,696	-	0'00
1890	-	-	-	73,834	65	8'81	15,049	32	21'28	8,557	16	18'79	9,013	6	6'67	10,278	8	7'79	1,754	-	0'00
1891	-	-	-	76,084	56	7'36	15,620	18	11'52	8,653	6	6'93	9,166	2	2'18	10,837	4	3'70	1,774	1	5'64

MIDDLESBROUGH REGISTRATION DISTRICT.

DETAILED TABLES—continued.

Year.	DARLINGTON REGISTRATION DISTRICT.						STOCKTON REGISTRATION DISTRICT.						HARTLEPOOL REGISTRATION DISTRICT.											
	Darlington, U.S.D.			Darlington, R.S.D.			Stockton-on-Tees, U.S.D.			Stockton, R.S.D.			Sedgefield, R.S.D.			Hartlepool, U.S.D.			West Hartlepool, U.S.D.			Hartlepool, R.S.D.		
	Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.	
		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.
1885	-	36,331	3	0.83	12,083	1	0.83	44,916	7	4.56	1	0.96	18,106	5	2.76	18,790	5	2.66	34,414	?	?	2,361	-	0.00
1886	-	36,625	12	3.28	11,970	1	0.84	45,718	10	2.79	2	4.87	18,351	2	4.09	19,239	6	3.42	35,089	?	?	2,410	1	4.45
1887	-	36,923	3	0.84	11,859	2	4.69	46,535	16	3.44	1	0.94	18,599	4	2.45	19,698	7	3.55	37,032	4	4.08	2,459	-	0.00
1888	-	37,223	5	4.34	11,749	1	0.85	47,337	3	0.63	1	0.89	18,850	6	3.48	20,155	4	4.98	38,416	1	0.26	2,510	-	0.00
1889	-	37,525	5	4.33	11,640	2	4.72	48,213	9	4.87	3	2.64	19,105	2	4.05	20,650	11	5.33	39,850	5	4.25	2,561	-	0.00
Mean of 5 Years, 1885-9		36,925	5.6	4.52	11,860	1.4	4.48	46,550	9	4.93	1.6	4.46	18,002	3.8	2.44	19,706	6.6	3.35	37,082	?	?	2,460	0.2	0.82
1890	-	37,829	17	4.50	11,532	4	3.47	49,074	46	9.38	14	44.90	19,364	1	0.53	21,143	14	6.63	41,339	9	2.48	2,613	-	0.60
1891	-	38,137	13	3.44	11,425	4	3.50	49,951	45	9.02	6	5.00	19,624	5	2.55	21,648	4	4.85	42,883	6	4.40	2,667	1	3.75

Year.	AUCKLAND REGISTRATION DISTRICT.						LANCHESTER REGISTRATION DISTRICT.																		
	Auckland, R.S.D.			Bishop Auckland, U.S.D.			Shildon and East Thickley, U.S.D.			Spennymoor, U.S.D.			Leadgate, U.S.D.			Consett, U.S.D.			Benfieldside, U.S.D.			Lanchester, R.S.D.			
	Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.		
		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.	Registered.
1885	-	60,537	9	4.49	10,277	?	?	9,048	?	?	5,969	?	?	4,350	?	?	7,576	-	0.00	5,032	-	0.00	43,088	5	4.46
1886	-	60,941	18	2.95	10,320	?	?	9,131	?	?	5,981	?	?	4,368	?	?	7,677	-	0.00	5,985	1	4.70	43,075	7	4.64
1887	-	61,346	8	4.34	10,363	?	?	9,215	1	4.08	2	3.54	4,885	?	?	7,779	2	2.57	6,044	-	0.00	44,270	14	3.46	
1888	-	61,755	20	3.24	10,406	?	?	9,300	-	0.00	4	6.67	4,405	?	?	7,883	1	4.27	6,100	-	0.00	44,873	17	3.79	
1889	-	62,166	31	4.98	10,450	?	?	9,385	7	7.45	5	8.30	4,423	?	?	7,988	1	4.25	6,157	1	4.63	45,484	17	3.74	
Mean of 5 Years, 1885-89		61,349	17.2	2.80	10,363	?	?	9,216	?	?	5,994	?	?	4,386	?	?	7,780	0.8	4.03	6,044	0.4	0.66	44,278	12	2.71
1890	-	62,580	33	5.28	10,494	8	7.63	9,471	3	3.47	6	9.95	4,442	2	4.50	8,004	-	0.00	6,215	-	0.00	46,103	18	3.90	
1891	-	63,005	12	4.90	10,537	?	?	9,558	6	6.27	3	4.96	4,400	?	?	8,202	-	0.00	6,273	-	0.00	46,731	8	4.74	

DETAILED TABLES—continued.

Year.	DURHAM REGISTRATION DISTRICT.										EASINGTON REGISTRATION DISTRICT.									
	Durham, U.S.D.					Willington, U.S.D.					Seaham Harbour, U.S.D.					Easington, R.S.D.				
	Brandon and Byskottles, U.S.D.		Durham, R.S.D.		Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.		Rate per 10,000 Population.
	Registered.	Rate per 10,000 Population.	Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.	
1885	1	0'67	2	4'64	12,178	1	4'29	7,751	1	2'20	31,884	7	2'20	8,180	2	2'47	34,863	14	4'02	
1886	—	4'64	1	0'80	12,514	4	5'15	7,760	5	4'56	32,022	5	4'56	8,293	9	48'85	35,221	10	2'84	
1887	2	4'84	5	3'89	12,859	1	4'29	7,769	7	2'18	32,160	7	2'18	8,469	6	7'13	35,582	21	5'90	
1888	1	0'67	2	4'51	13,213	—	—	7,778	6	4'86	32,249	6	4'86	8,526	2	2'35	35,947	14	3'90	
1889	2	4'34	1	0'74	13,577	1	4'28	7,788	5	4'54	32,439	5	4'54	8,644	7	8'10	36,315	13	3'58	
Mean of 5 Years, 1885-9	1'4	4'61	2'2	4'71	12,868	1'4	4'80	7,769	6	4'87	32,161	6	4'87	8,410	5'2	6'18	35,585	14'4	4'04	
1890	1	0'67	4	2'87	13,951	1	4'28	7,797	5	4'53	32,581	5	4'53	8,764	6	6'85	36,688	8	2'78	
1891	3	2'02	1	0'70	14,335	3	3'84	7,806	6	4'83	32,721	6	4'83	8,886	?	?	37,064	7	4'89	
Year.	HOUGHTON-LE-SPRING REGISTRATION DISTRICT.										CHESTER-LE-STREET REGISTRATION DISTRICT.									
	Houghton-le-Spring, U.S.D.					Houghton-le-Spring, R.S.D.					Chester-le-Street, R.S.D.					Sunderland, U.S.D.				
	Enteric Fever Deaths.		Population estimated to Middle of Year.		Rate per 10,000 Population.	Enteric Fever Deaths.		Population estimated to Middle of Year.		Rate per 10,000 Population.	Enteric Fever Deaths.		Population estimated to Middle of Year.		Rate per 10,000 Population.	Enteric Fever Deaths.		Population estimated to Middle of Year.		Rate per 10,000 Population.
	Registered.	Rate per 10,000 Population.	Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.	Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.	Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.	Registered.	Rate per 10,000 Population.	
1885	—	0'00	9	3'06	29,478	15	3'22	46,563	16	4'42	112,987	16	4'42	8,945	2	2'24	15,734	3	4'90	
1886	3	4'80	8	2'69	29,811	5	4'06	47,240	13	4'12	115,873	13	4'12	9,155	—	0'00	16,027	3	4'87	
1887	1	4'59	18	5'97	30,147	9	4'88	47,927	30	2'82	118,832	30	2'82	9,371	3	3'20	16,325	4	2'45	
1888	1	4'57	16	5'35	30,488	14	2'88	48,024	20	4'64	121,867	20	4'64	9,532	2	2'69	16,629	4	2'40	
1889	—	0'00	37	42'00	30,832	10	2'03	49,331	28	2'24	124,980	28	2'24	9,817	2	2'04	16,839	3	4'77	
Mean of 5 Years, 1885-9	1	4'59	17'6	5'84	30,151	10'6	2'17	47,937	31'4	4'80	118,908	31'4	4'80	9,376	1'8	4'92	16,331	3'4	2'68	
1890	1	4'55	9	2'89	31,181	15	3'00	50,049	35	2'73	128,172	35	2'73	10,049	1	4'00	17,254	6	3'48	
1891	3	4'63	12	3'80	31,533	7	4'38	50,776	37	2'82	131,445	37	2'82	10,285	3	2'92	17,575	5	2'84	

DETAILED TABLES—continued.

SOUTH SHIELDS REGISTRATION DISTRICT.														
Year.	South Shields, U.S.D.				Jarrow, U.S.D.				Hebburn, U.S.D.				South Shields, R.S.D.	
	Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.		Rate per 10,000 Population.	
		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.		
1885	-	5	0.77	28,690	2	0.70	13,656	-	0.00	10,522	-	0.00	-	
1886	-	11	1.64	29,502	2	0.63	14,133	1	0.71	10,878	4	3.68	-	
1887	-	8	1.15	30,336	4	1.33	14,627	-	0.00	11,248	1	0.89	-	
1888	-	10	1.39	31,194	2	0.64	15,138	2	1.32	11,627	2	1.72	-	
1889	-	8	1.08	32,077	1	0.31	15,667	7	4.47	12,020	1	0.83	-	
Mean of 5 Years, 1885-9	-	8.4	1.24	30,330	2.2	0.72	14,644	2	1.37	11,259	1.6	1.42	-	
1890	-	18	2.35	32,984	13	3.94	16,214	6	3.70	12,427	4	3.22	-	
1891	-	14	1.77	33,917	5	1.45	16,781	1	0.60	12,848	5	3.89	-	

GATESHEAD REGISTRATION DISTRICT.																		
Year.	Gateshead, U.S.D.				Whickham, U.S.D.				Blaydon, U.S.D.				Felling, U.S.D.		Ryton, U.S.D.		Enteric Fever Deaths.	
	Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.	
		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.
1885	75,540	10	1.36	8,464	1	1.18	11,754	17	1.47	4,963	-	0.00	16,833	4	2.38	161,543	56	3.47
1886	75,510	13	1.72	8,584	2	2.33	12,021	1	0.83	5,061	1	1.98	16,943	9	5.32	165,606	34	2.65
1887	77,532	16	2.66	8,705	1	1.15	12,293	-	0.00	5,160	-	0.00	17,053	4	2.35	169,771	42	2.48
1888	79,608	1	0.13	8,827	2	2.26	12,571	5	3.98	5,292	-	0.00	17,164	-	0.00	174,041	23	1.32
1889	81,740	8	0.98	8,952	4	4.47	12,856	2	1.55	5,366	2	3.74	17,275	2	1.16	178,418	16	0.90
Mean of 5 Years, 1885-9	77,586	9.6	1.24	8,706	2	2.30	12,299	5	4.07	5,162	0.6	1.16	17,053	3.8	2.33	169,878	34.2	2.01
1890	83,930	42	5.00	9,078	5	5.51	13,148	2	1.52	5,472	1	1.83	17,388	4	2.30	182,905	21	1.15
1891	86,177	11	1.28	9,206	3	3.26	13,446	4	2.98	5,580	1	1.79	17,501	5	2.86	187,505	18	0.96

NEWCASTLE-ON-TYNE REGISTRATION DISTRICT.															
Year.	Newcastle-on-Tyne, U.S.D.				Benwell and Fenham, U.S.D.				Newcastle-on-Tyne, U.S.D.				Benwell and Fenham, U.S.D.		
	Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.	
		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.
1885	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1886	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1887	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1888	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1889	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mean of 5 Years, 1885-9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1890	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1891	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

DETAILED TABLES—continued.

Year.	Tynemouth Registration District.											
	Tynemouth, U.S.D.			Walker, U.S.D.			Wallsend, U.S.D.			Willington Quay, U.S.D.		
	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.
	Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.	
1885	3	0'67	45,018	3	2'92	10,230	—	0'00	5,514	1	1'81	1,038
1886	3	0'66	45,233	2	1'92	10,439	2	2'29	5,649	—	0'00	1,024
1887	4	0'88	45,449	1	0'94	10,623	1	1'08	5,788	1	1'73	1,011
1888	2	0'44	45,665	2	1'85	10,810	—	0'00	5,980	—	0'00	997
1889	4	0'87	45,883	4	3'64	11,000	—	0'00	6,076	1	1'65	984
Mean of 5 Years, 1885-9	0'2	0'70	45,450	2'4	2'26	10,626	0'6	0'65	5,791	0'6	1'63	1,010
1890	10	2'17	46,102	1	0'89	11,105	1	0'90	6,225	1	1'61	971
1891	13	2'81	46,322	—	0'00	11,300	4	3'40	6,378	1	1'37	958

Year.	Tynemouth Registration District—continued.											
	Cramlington, U.S.D.			Seghill, U.S.D.			South Blyth, U.S.D.			Cowpen, U.S.D.		
	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.
	Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.	
1885	—	0'00	5,837	—	0'00	2,188	1	3'18	11,174	1	0'89	26,940
1886	1	1'71	5,800	—	0'00	2,202	1	3'11	11,470	21	18'30	27,260
1887	4	6'80	5,882	—	0'00	2,216	—	0'00	11,773	12	10'30	27,585
1888	—	0'00	5,905	—	0'00	2,230	—	0'00	12,084	3	2'43	27,913
1889	2	3'33	5,927	—	0'00	2,244	—	0'00	12,403	7	5'65	28,245
Mean of 5 Years, 1885-9	1'4	2'38	5,882	—	0'00	2,216	0'4	1'21	11,781	8'8	7'47	27,608
1890	1	1'63	5,949	—	0'00	2,258	—	0'00	12,730	7	5'50	28,582
1891	1	1'6	5,972	—	0'00	2,272	2	5'18	13,036	28	21'45	28,922

DETAILED TABLES—continued.

Year.	CASTLE WARD REGISTRATION DISTRICT.						MORPETH REGISTRATION DISTRICT.														
	South Gosforth, U.S.D.			Castle Ward, R.S.D.			Morpeth, U.S.D.		Bedlingtonshire, U.S.D.		Newbiggin-by-the-Sea, U.S.D.		Morpeth, R.S.D.								
	Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.		Population estimated to Middle of Year.	Enteric Fever Deaths.							
		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.		Registered.	Rate per 10,000 Population.						
1885	-	-	-	5,061	-	0'00	16,433	7	4'26	5,073	-	0'00	15,518	9	5'78	1,466	-	0'00	16,682	11	6'62
1886	-	-	-	5,311	-	0'00	16,637	4	2'41	5,098	-	0'00	15,706	2	1'27	1,485	-	0'00	16,984	7	4'42
1887	-	-	-	5,572	3	5'39	16,844	6	3'56	5,123	-	0'00	16,017	1	0'62	1,504	1	6'67	17,342	5	2'89
1888	-	-	-	5,847	2	3'42	17,053	3	1'76	5,148	2	3'88	16,272	1	0'62	1,523	-	0'00	17,709	1	0'56
1889	-	-	-	6,135	2	3'26	17,265	3	1'74	5,174	1	1'94	16,532	10	6'05	1,543	-	0'00	18,083	4	2'21
Mean of 5 years, 1885-9	-	-	-	5,585	1'4	2'51	16,846	4'6	2'73	5,123	0'6	1'17	16,021	4'6	2'87	1,504	0'2	1'33	17,350	5'6	3'26
1890	-	-	-	6,437	4	6'21	17,479	8	4'58	5,199	-	0'00	16,795	7	4'23	1,563	-	0'00	18,465	4	2'47
1891	-	-	-	6,754	1	1'48	17,696	4	2'26	5,225	-	0'00	17,062	7	4'11	1,554	-	0'00	18,835	2	1'06



